

HALLIBURTON

RESERVOIR
MONITORING TOOL
ELITE

CompanyEast Cheyenne Gas Storage, LLC.
WellDOROTHY STRANGE #1 WP-D011
FieldWest Peetz
CountyLoganStateCO

CompanyEast Cheyenne Gas Storage, LLC.
WellDOROTHY STRANGE #1 WP-D011
FieldWest Peetz
CountyLoganStateCO

API No.: 05-075-07146-00
Location: 2304' FSL & 1639' FEL NWSE
Serv #: 903182643
Other Services

Gauge Ring/JB
ACX
CAST-M
Plug set

Sec: 6Twp: 11N Rge: 52W

Permanent Datum
Log Measured From
Drilling Measured From

G.L.
K.B.
K.B.

Elevation
13' Ft. above perm. datum
4547'

K.B.
D.F.
G.L.

Elevation
4560'
4560'
4547'

Date @ Time Logged
Run No.
Depth - Driller
Depth - Logger
Bottom - Logged Interval
Top - Log Interval
Max. Recorded Temp.
CEMENTING DATA
Date / Time Cemented
Primary / Squeeze
Expected
Compressive Strength
Cement Volume
Cement Type / Weight
Formulation
Mud Type / Mud Wgt.

3/25/2016 @ 19:20
ONE
6220'
5137'
5135'
SURFACE
167 F
Surface
String

Type Fluid in Hole
Density of Fluid
Fluid Level
Cement Top Est. Logged
Equipment / Location
Recorded by
Witnessed by
Protection
String

FRESH WATER
8.4#
SURFACE
N/A
11875120 / BRIGHTON
J. SCHMIDT & P. DIMPL
G. FRANCIS / G. OHLMAN
Liner

Borehole Record
Run Number
Bit
From
To
Size
9-5/8"
5.5"

Casing & Tubing Record
Weight
25.4#
15.5#
From
0'
0'
To
215'
5298'

<<< Fold Here >>>

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

Comments

1. LOG WAS CORRELATED TO J-W WIRELINE CEMENT BOND LOG DATED 02/04/2011.

2. RMT-I LOGGED IN CAPTURE MODE

3. LOGGING INTERVALS PER CUSTOMER REQUEST

4. RMT-I GENERATOR VOLTAGE: 101V

5. SPLICE AT 4830'.

HALLIBURTON CREW: JASON WILKERSON & BRANDON SHUPE

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, BRIGHTON, CO

Service Ticket No.	903182643	API No.	05075071460000	PGM Ver	WARRIOR 8
The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client					
EQUIPMENT DATA					
TELEMETRY		RESERVOIR MONITORING TOOL			
Run No.	ONE	Run No.	ONE	Run No.	
Serial No.	10010734	Serial No.	11917921	Serial No.	
Model No.	TTTC-U-002	Model No.	RMTI-A	Model No.	
Diameter	1.688"	Diameter	2.125"	Diameter	
LOGGING DATA					
General Data					
Pass	Depths		Well Head	Speed	Logging Run Comments
No	From	To	Pressure	Ft/Min	

ONE	TD	200'	1200 PSI	15 FPM	MAIN LOG SECTION			
	GAMMA RAY		NEAR BORE SI (SCBN)		RATIO (RNF)		SGIN	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	L
	0 API	150 API	200	0	2	0.5	60	0
DIRECTIONAL INFORMATION								
Maximum Deviation			deg. @		KOP			

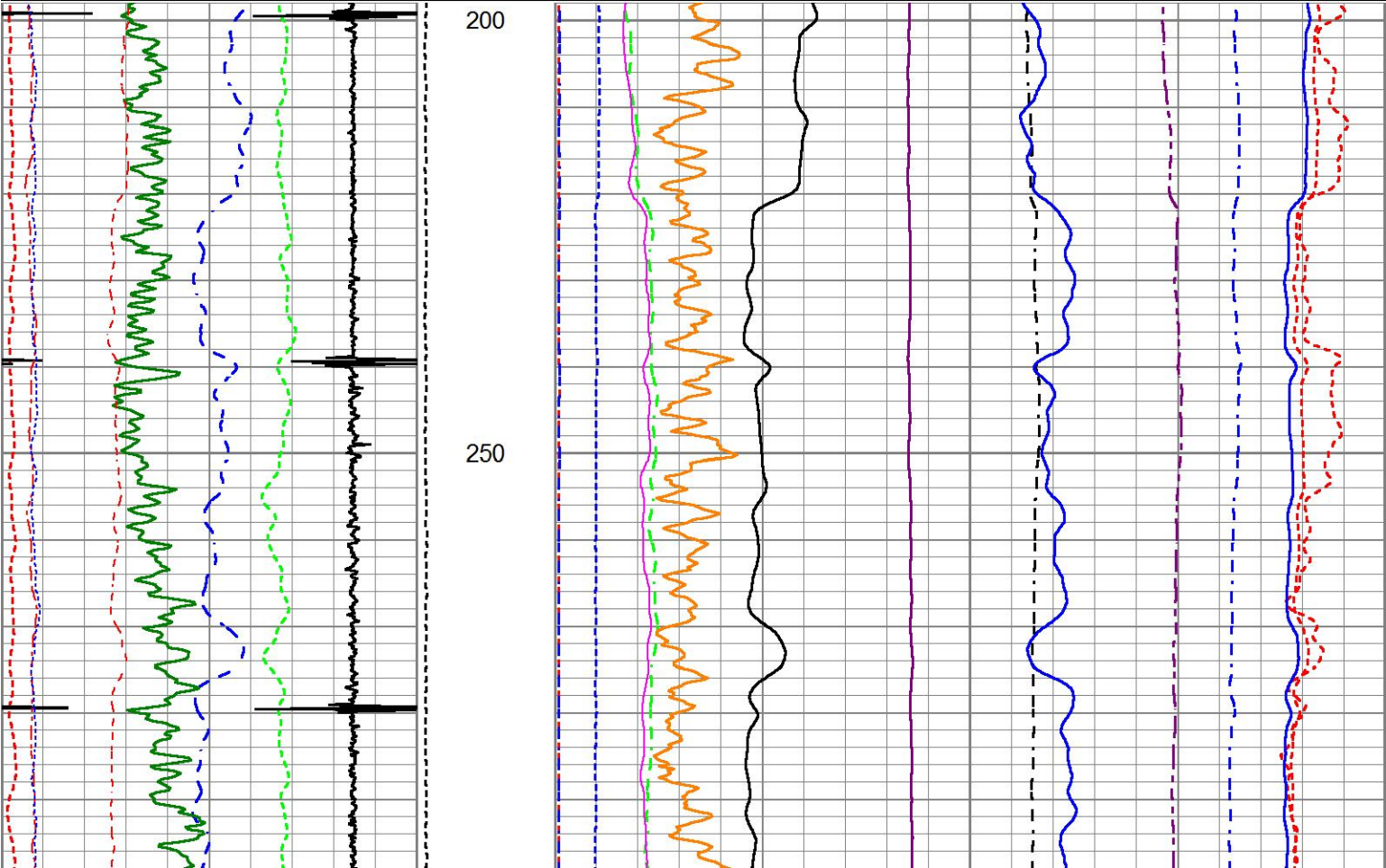
MAIN PASS TOP

HALLIBURTON

5" = 100'

Database File	dorothy_1_rmt.db
Dataset Pathname	MAIN_TOP1
Presentation Format	1_RMTE~1
Dataset Creation	Sat Mar 26 07:33:56 2016
Charted by	Depth in Feet scaled 1:240

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)		1.22
0	OAI	100	0 (lb 1750	60	SGIN		0
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP)
0	GR (GAPI)	150		0	RICF	6	60000 Far Counts (FCAP)
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000 FAR INTEL CT (FSIN)
20000	CCL	18000		0	H YIELD (YH1)	1	10000(NEAR INTEL CT (NSIN)
0	IN FIT ERR (CFTR1) NEAR	1		0.3	PHIT ()	-0.1	ET INL NEAR (NNII
0	IN FIT ERR CFTR2) FAR	1		0	STUN1	1	50000 -1000
				0	STUN2	1	
				0	NFTR	5	
					INOX2		
					-1500	1500	



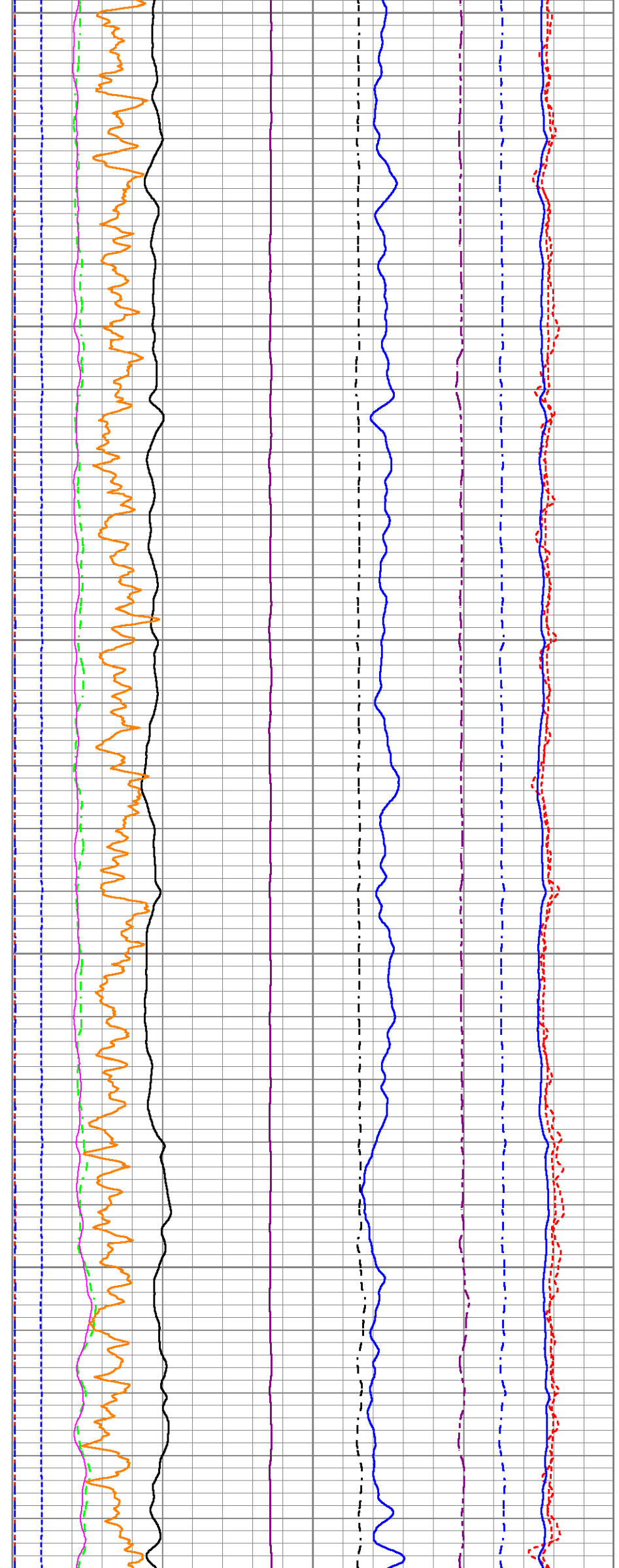
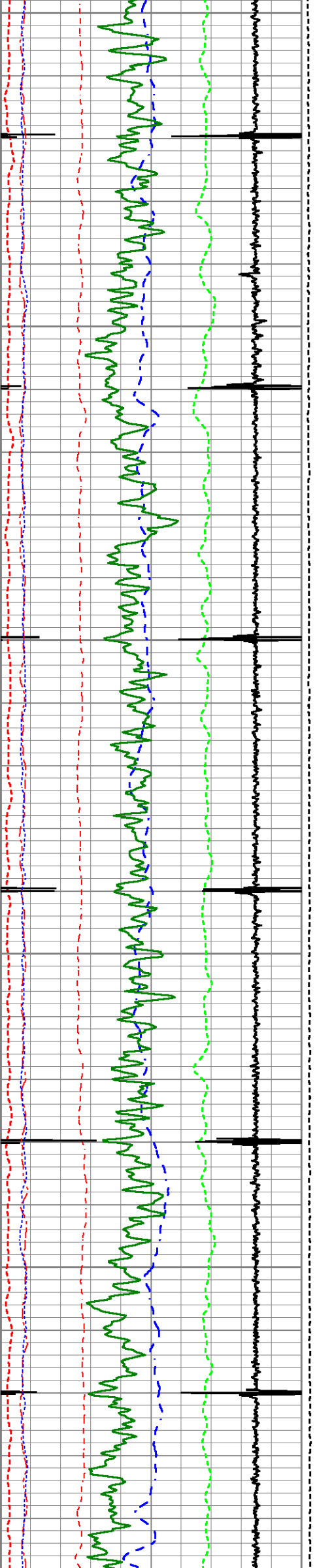
300

350

400

450

500



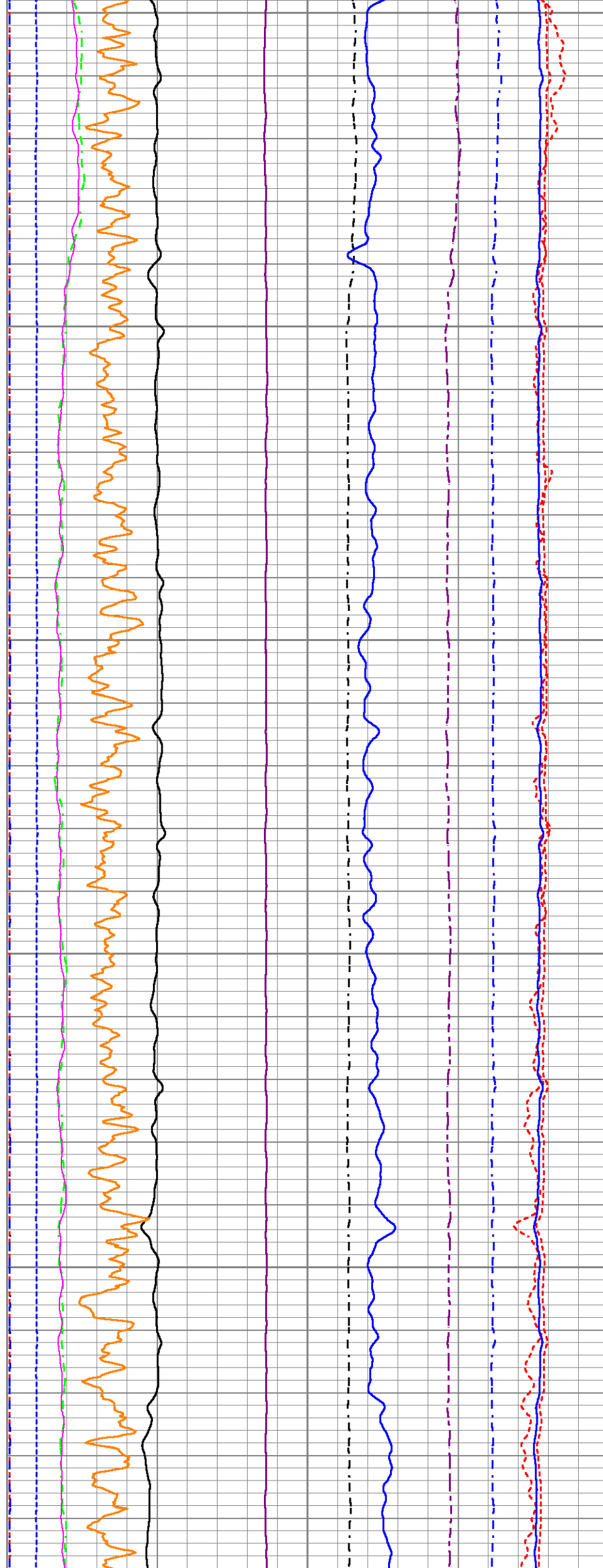
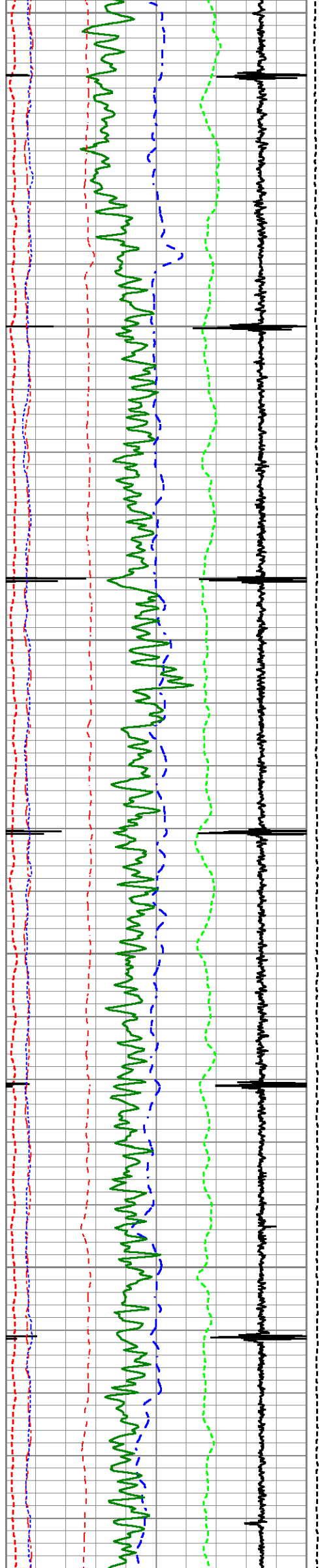
550

600

650

700

750



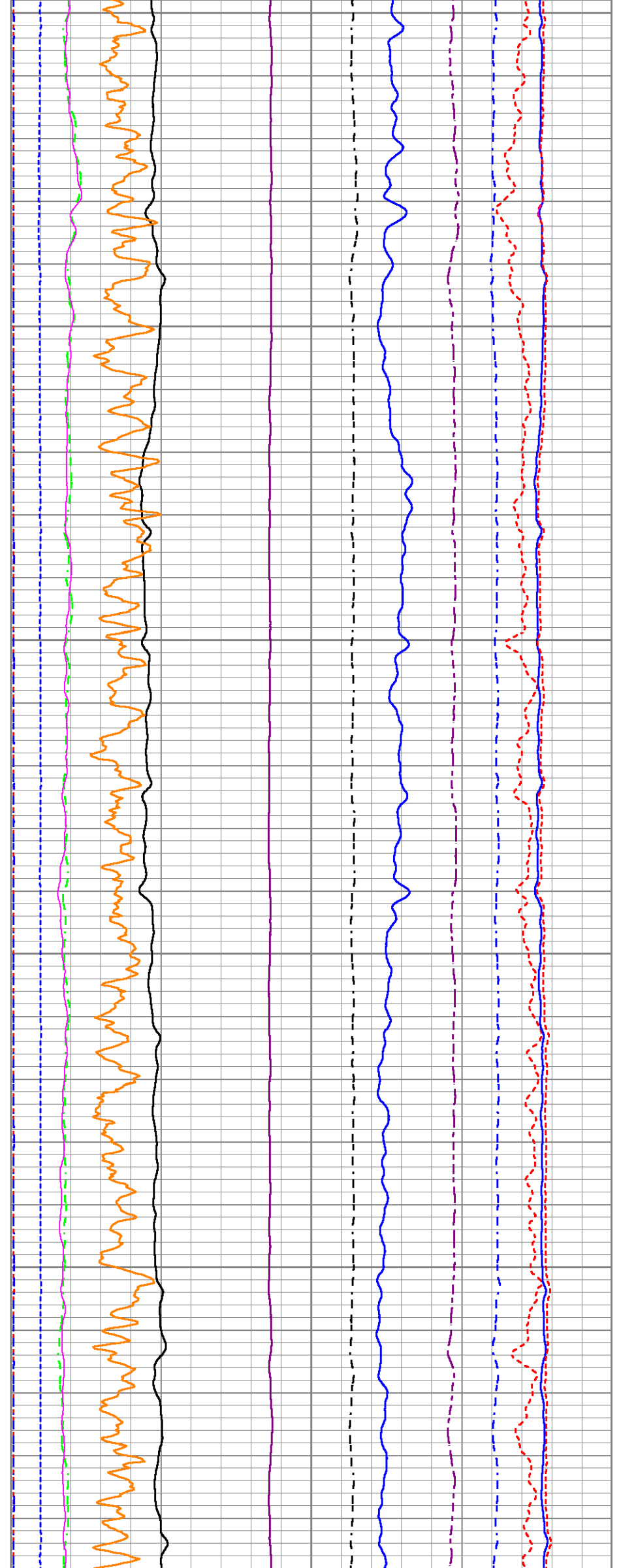
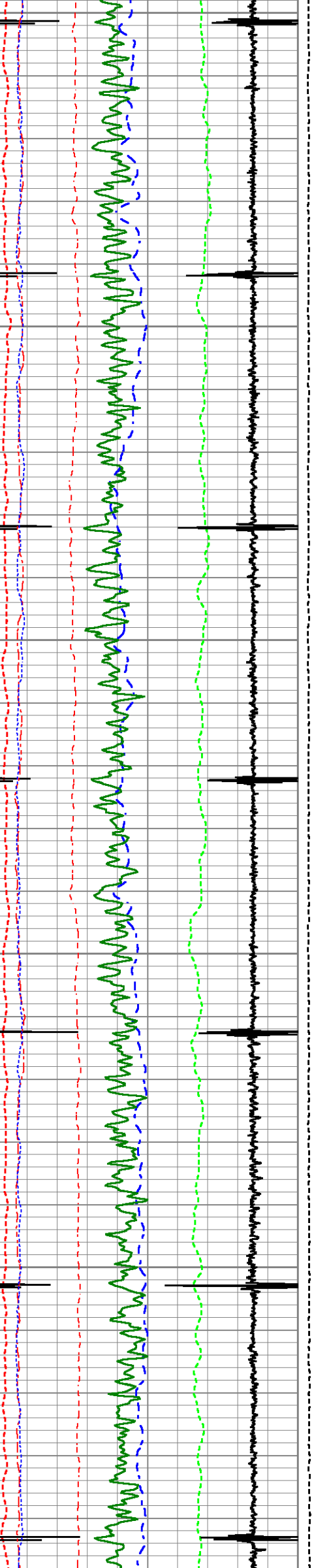
800

850

900

950

1000



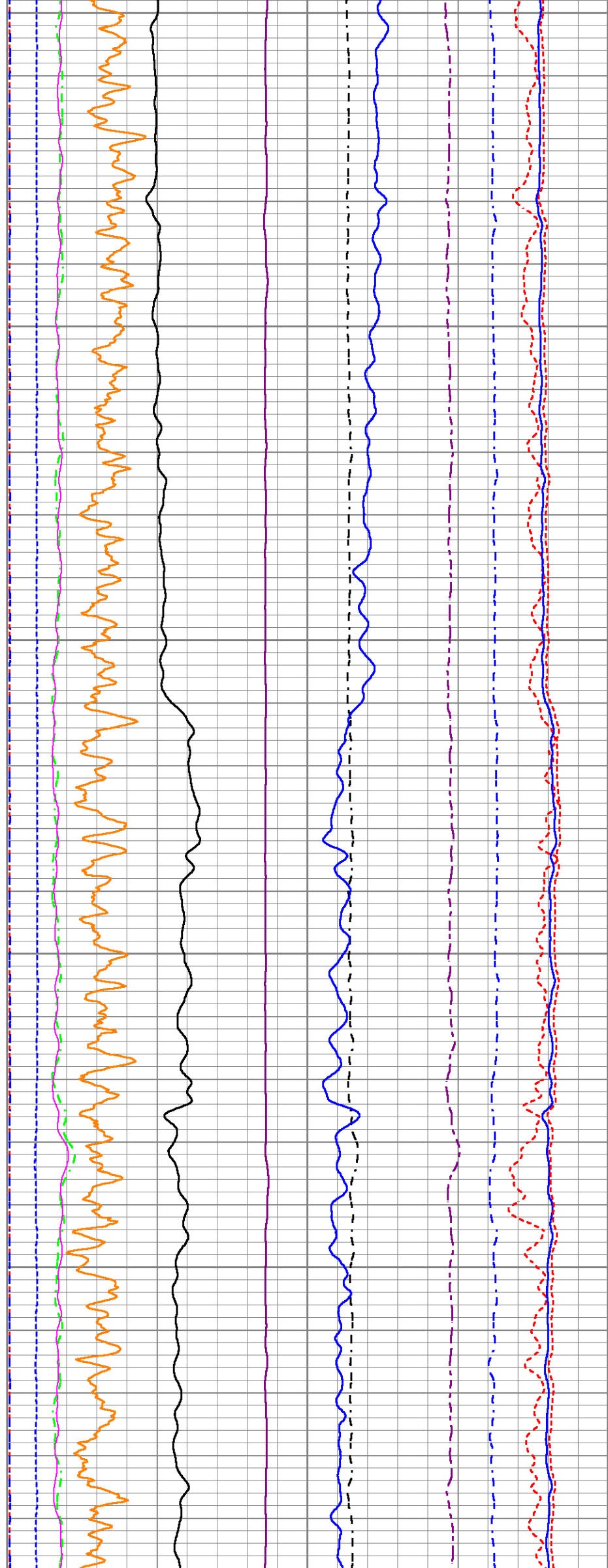
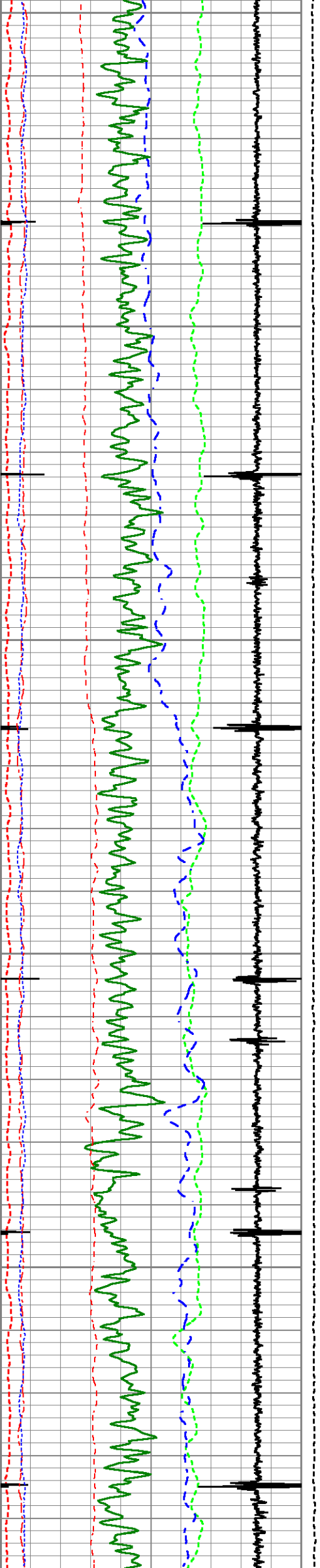
1050

1100

1150

1200

1250



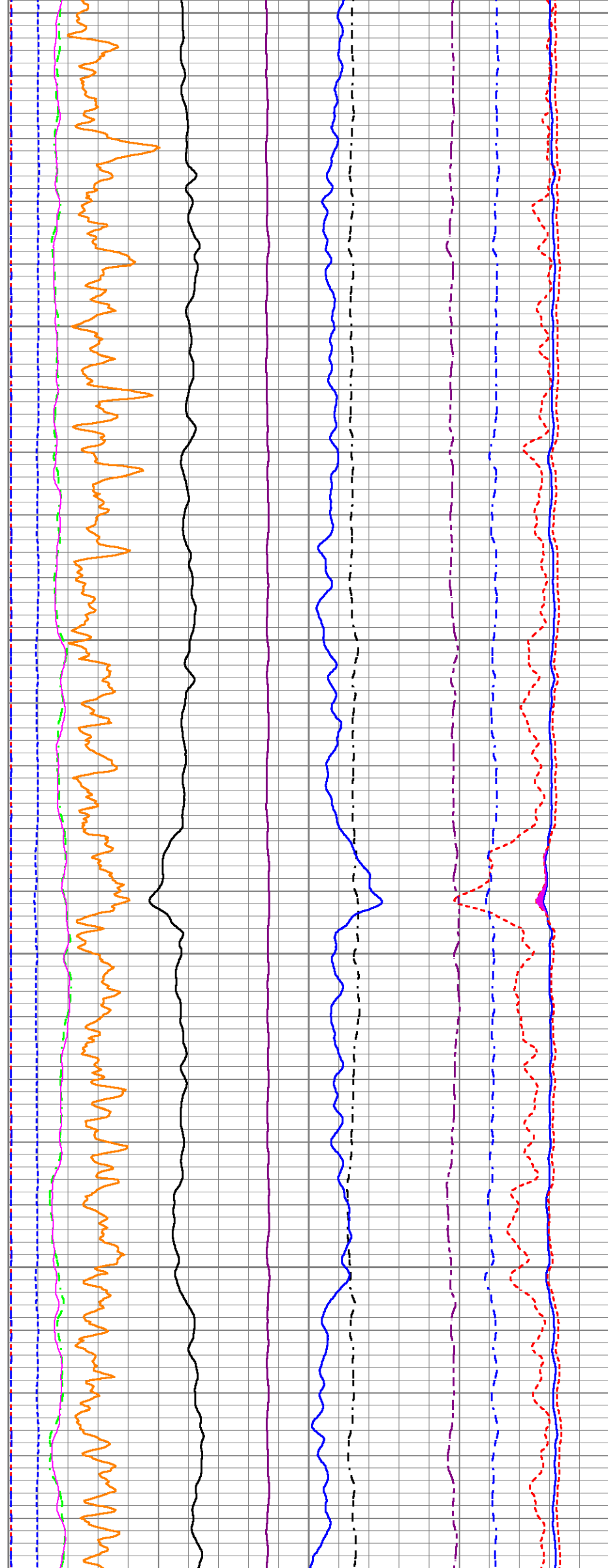
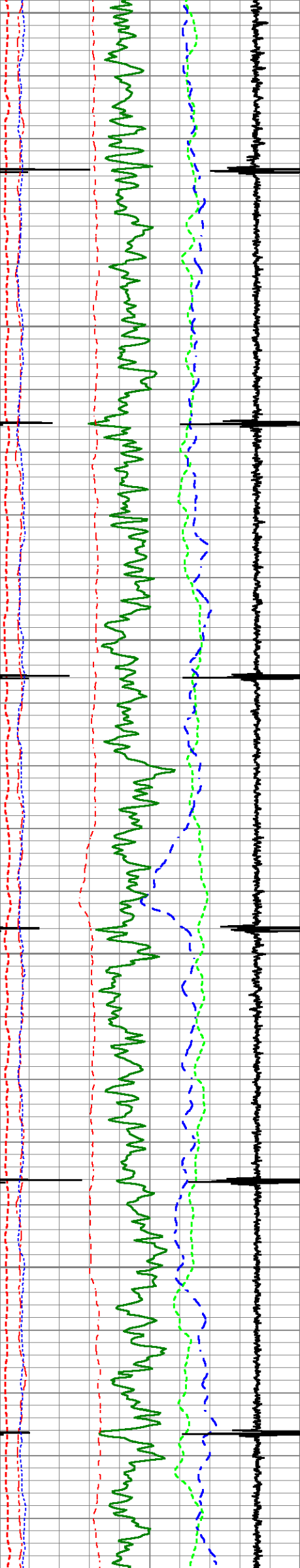
1300

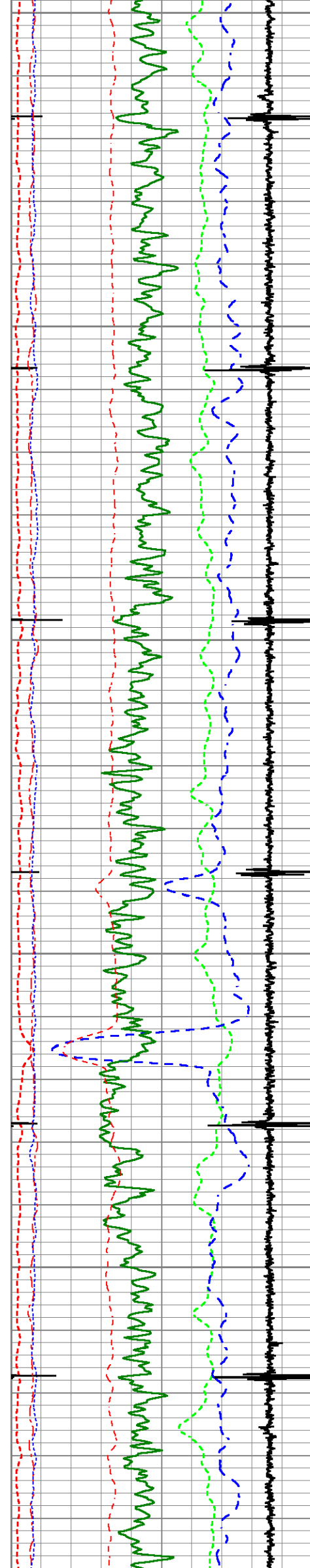
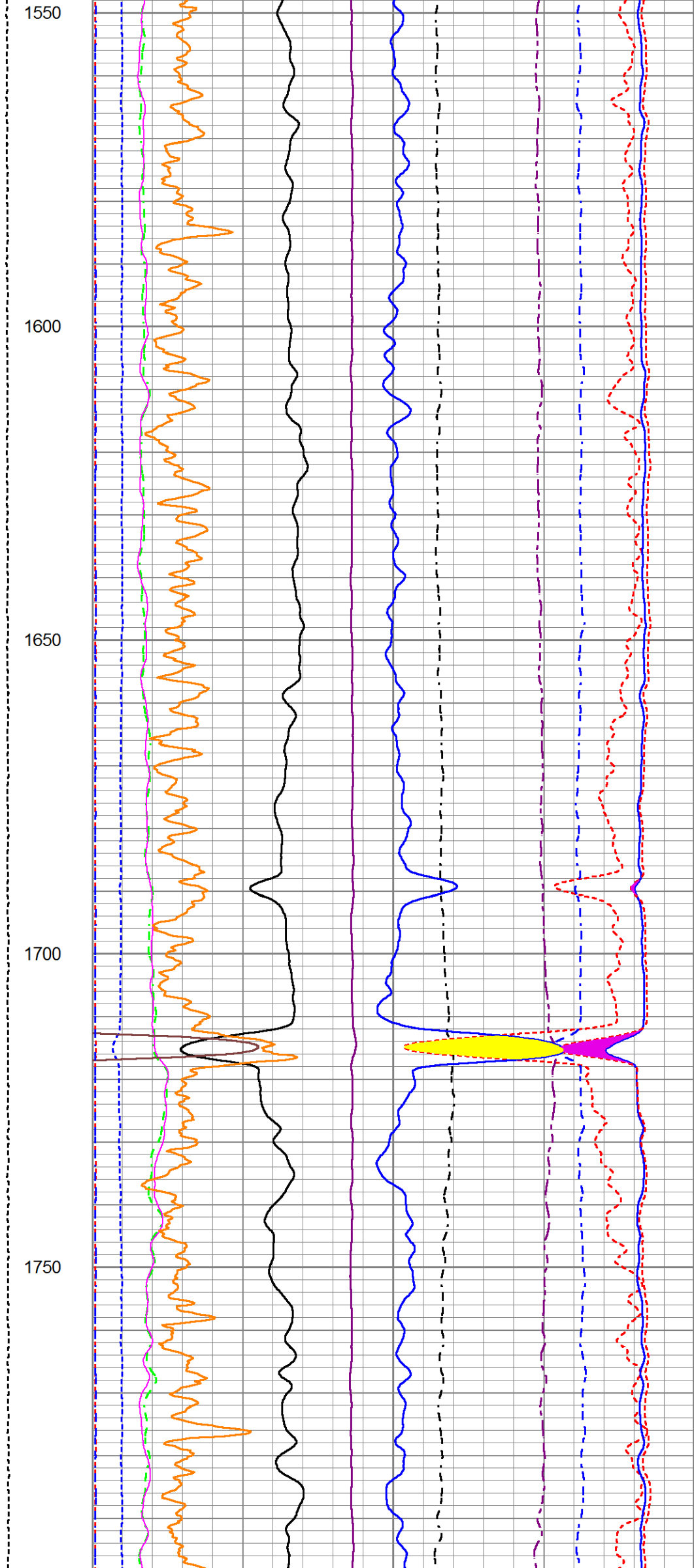
1350

1400

1450

1500





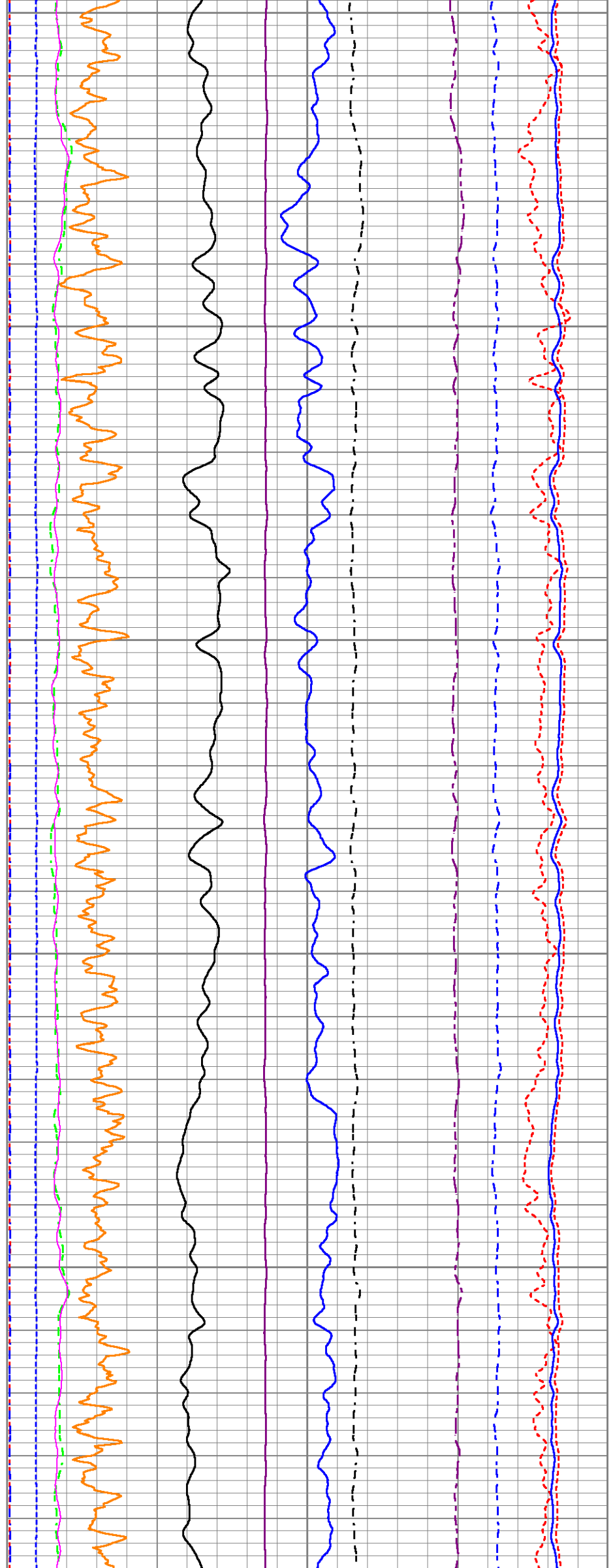
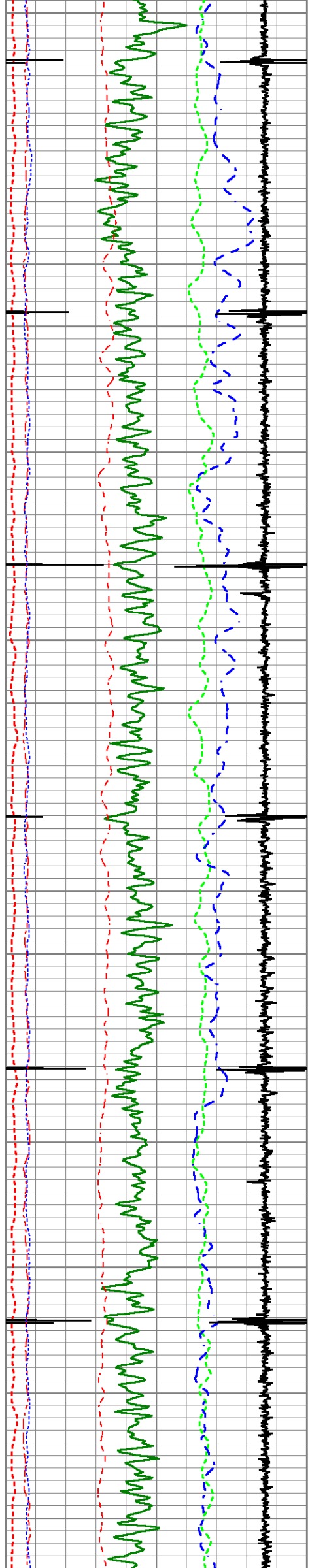
1800

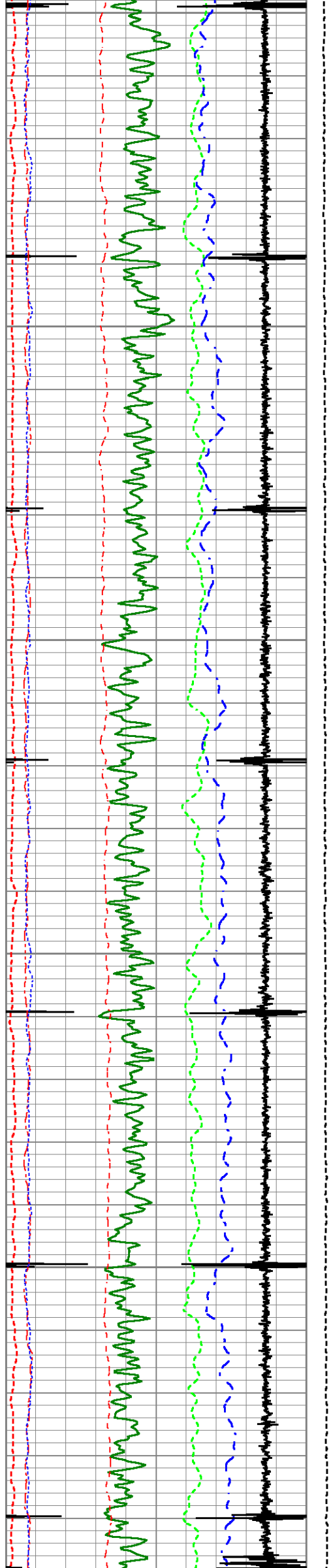
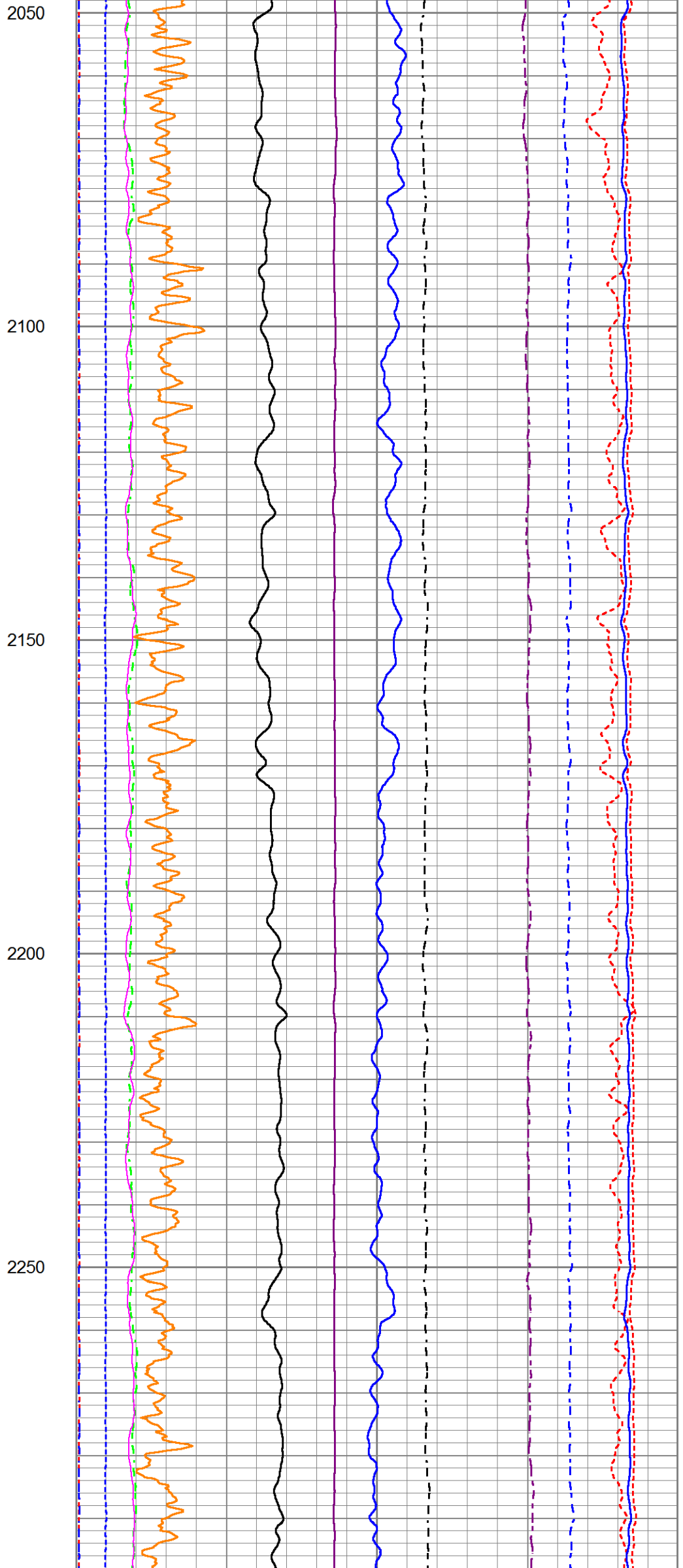
1850

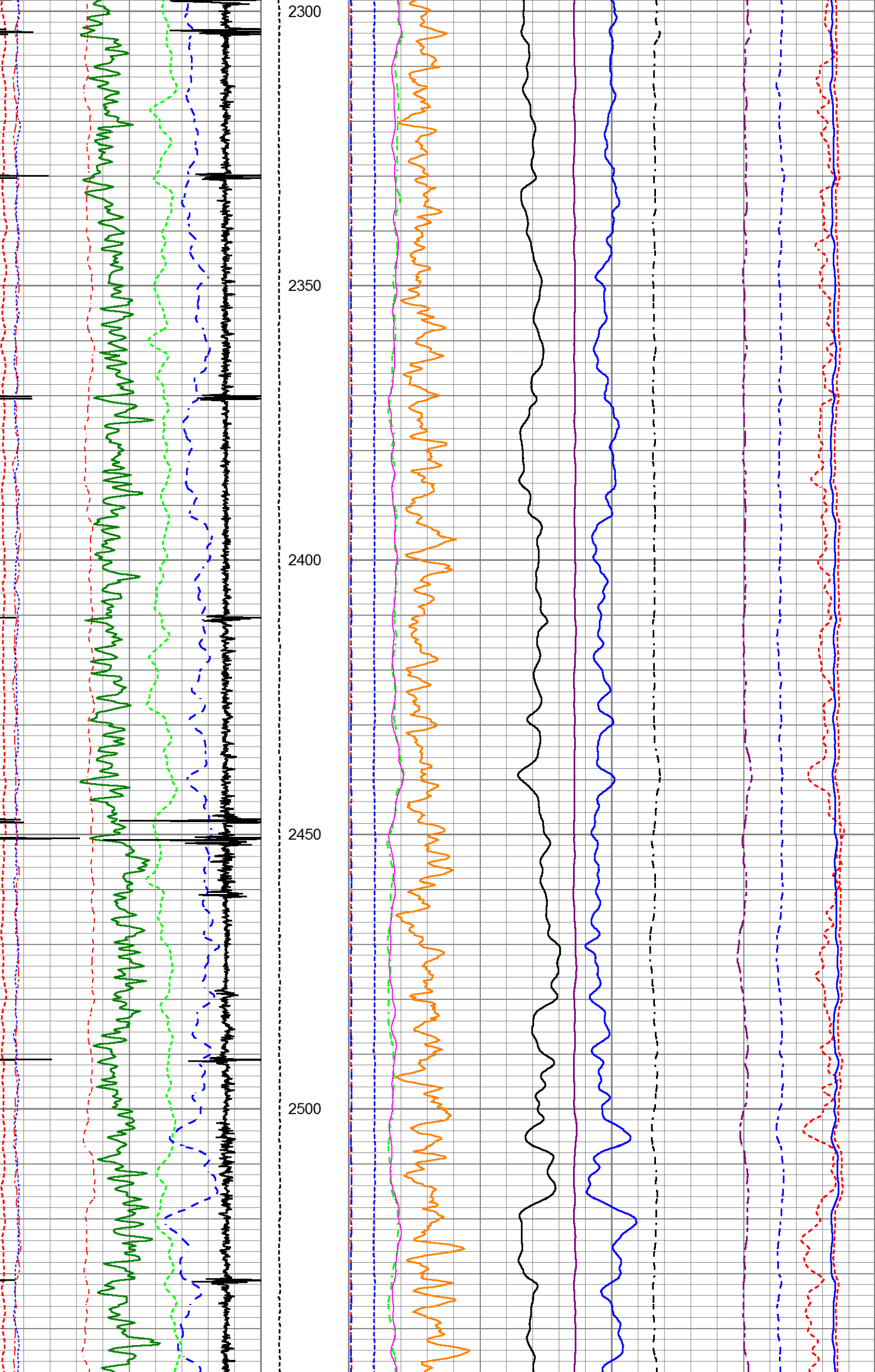
1900

1950

2000







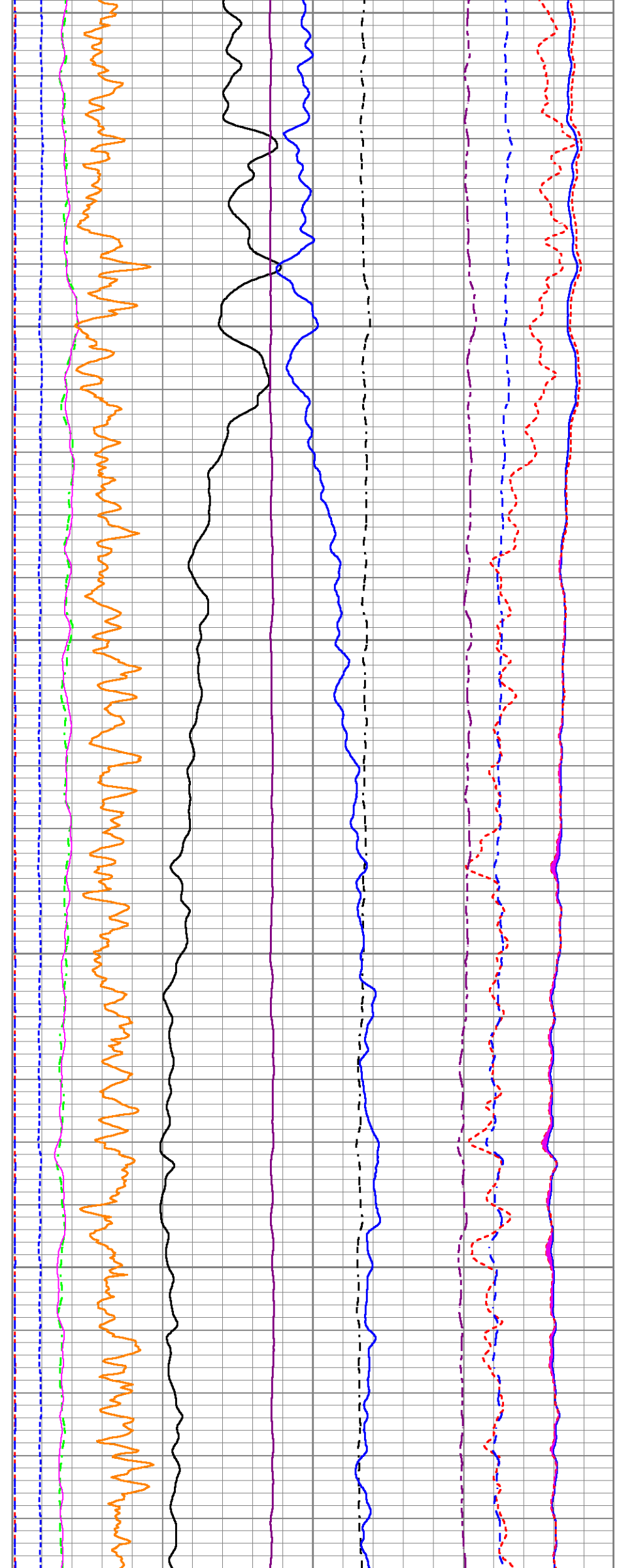
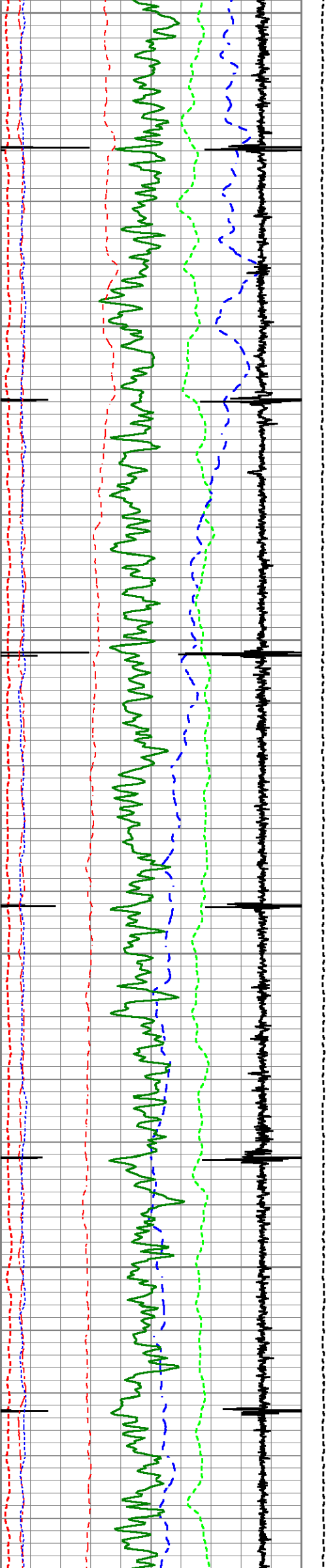
2550

2600

2650

2700

2750



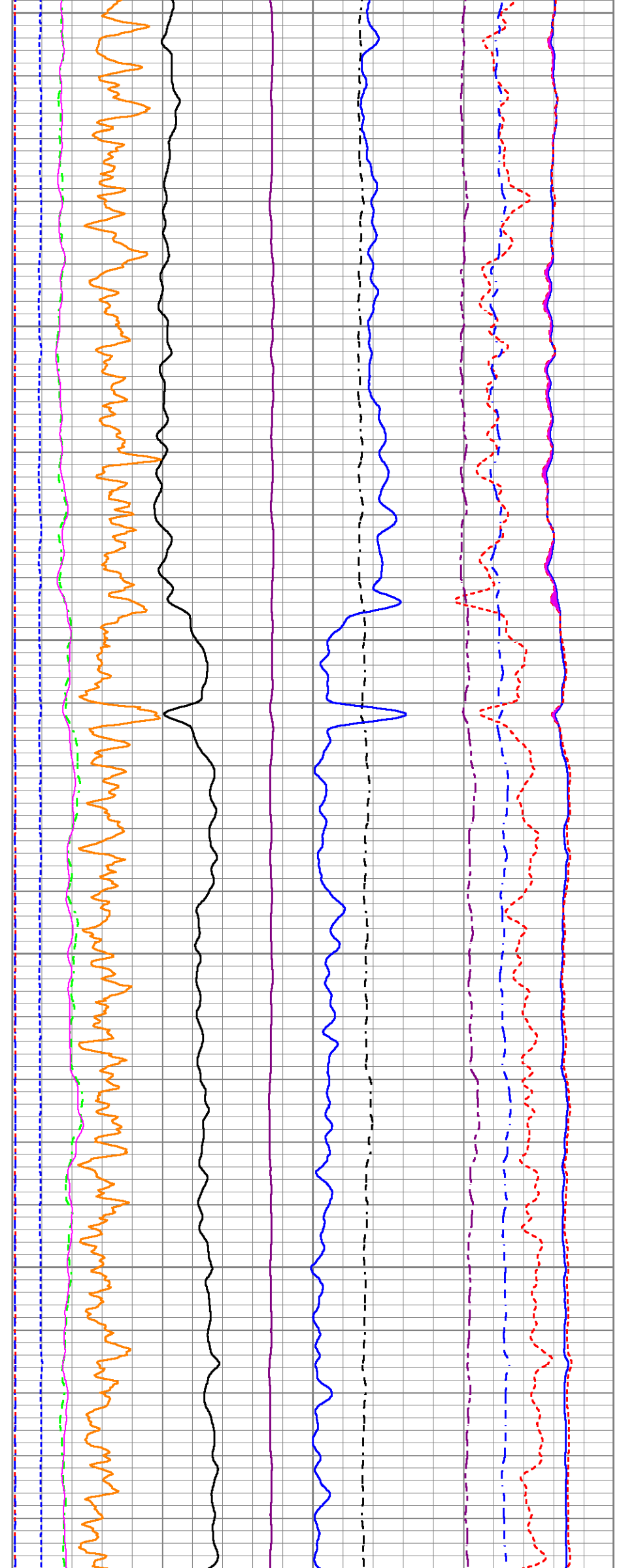
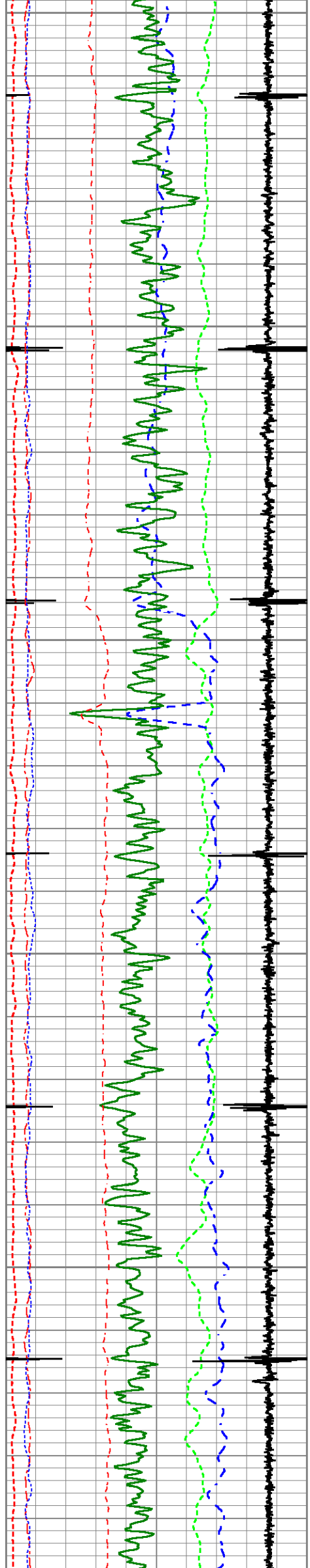
2800

2850

2900

2950

3000



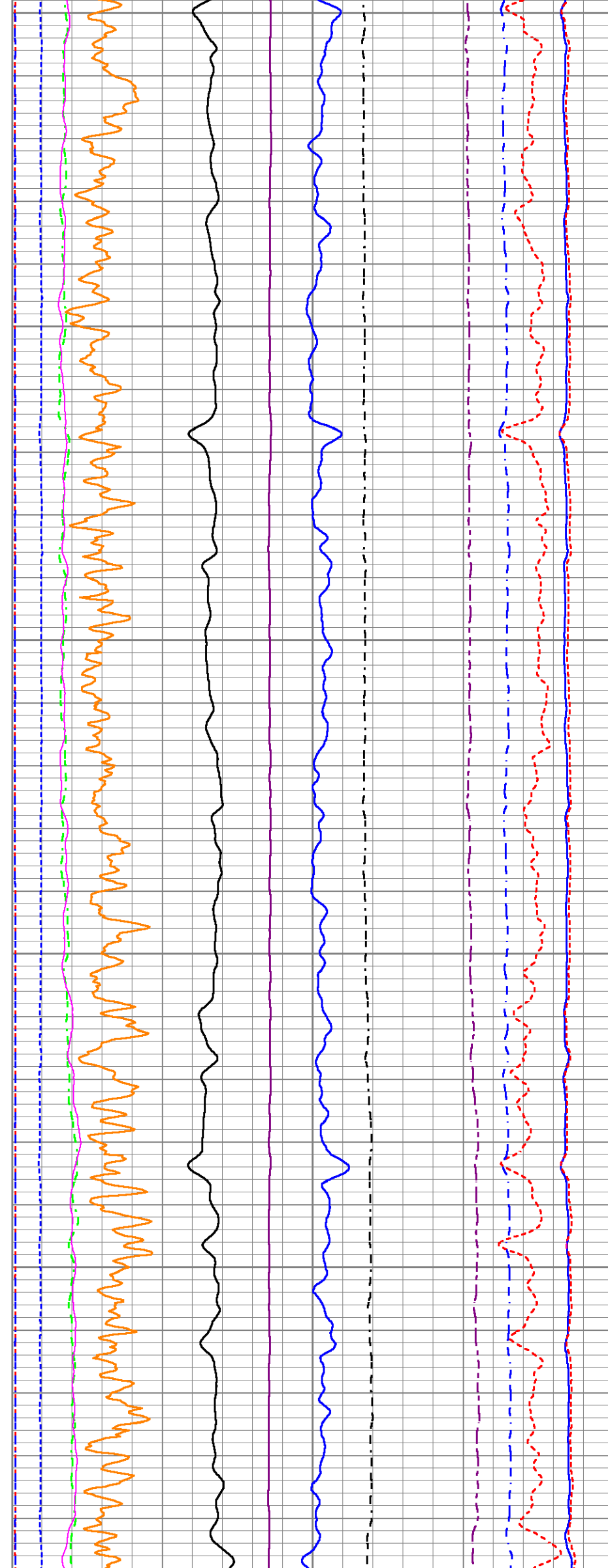
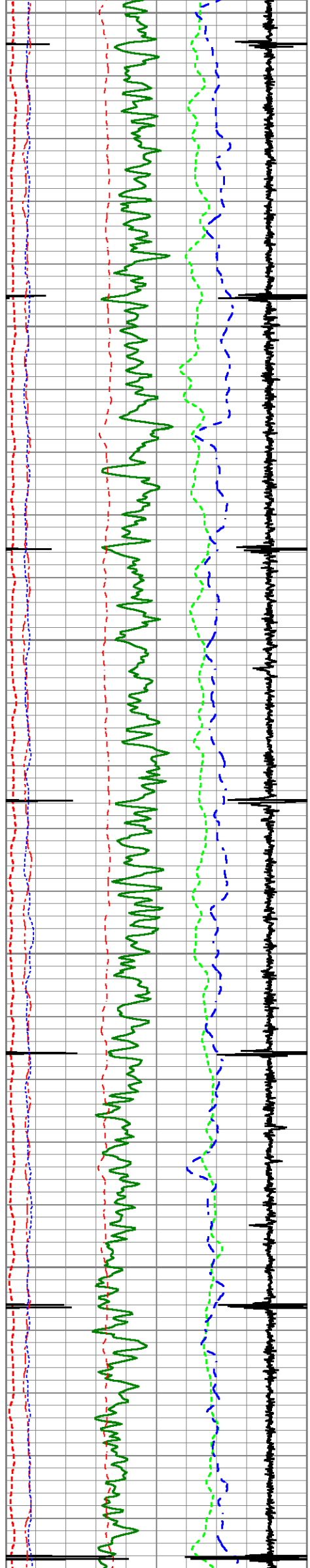
3050

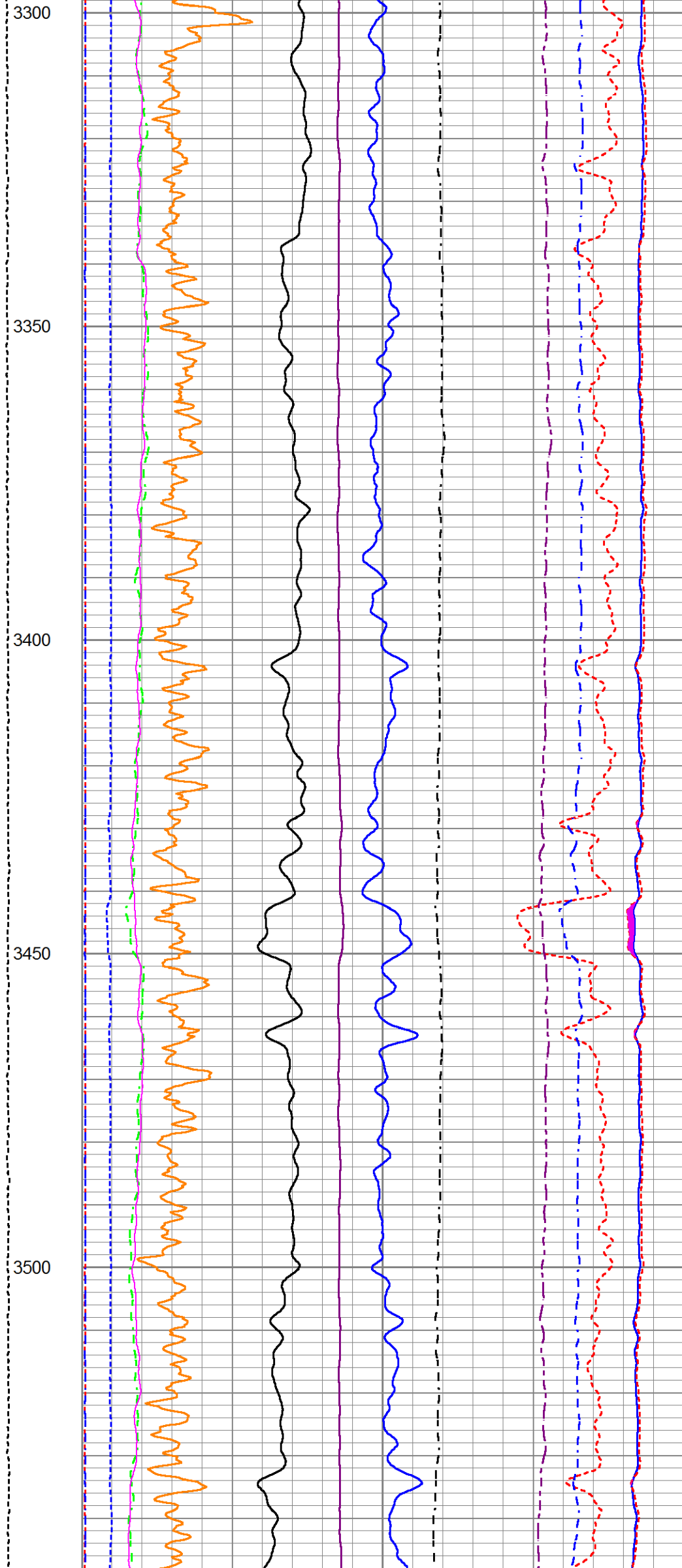
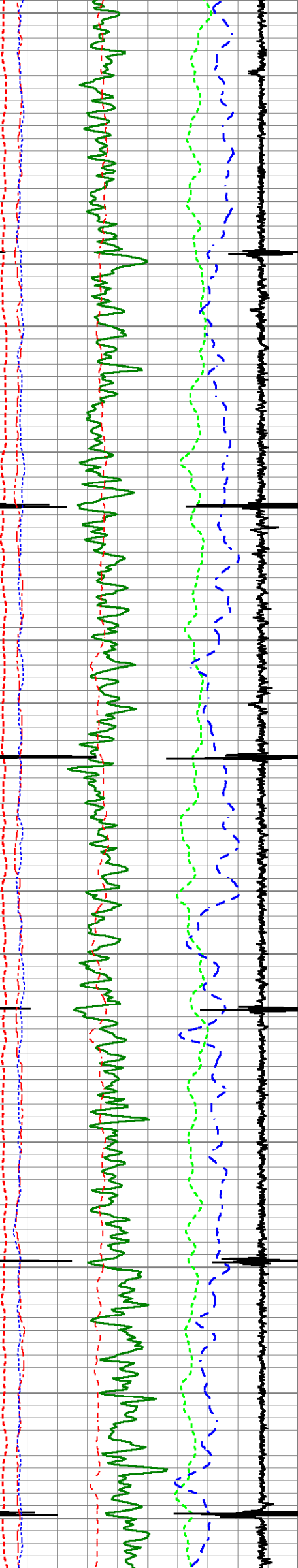
3100

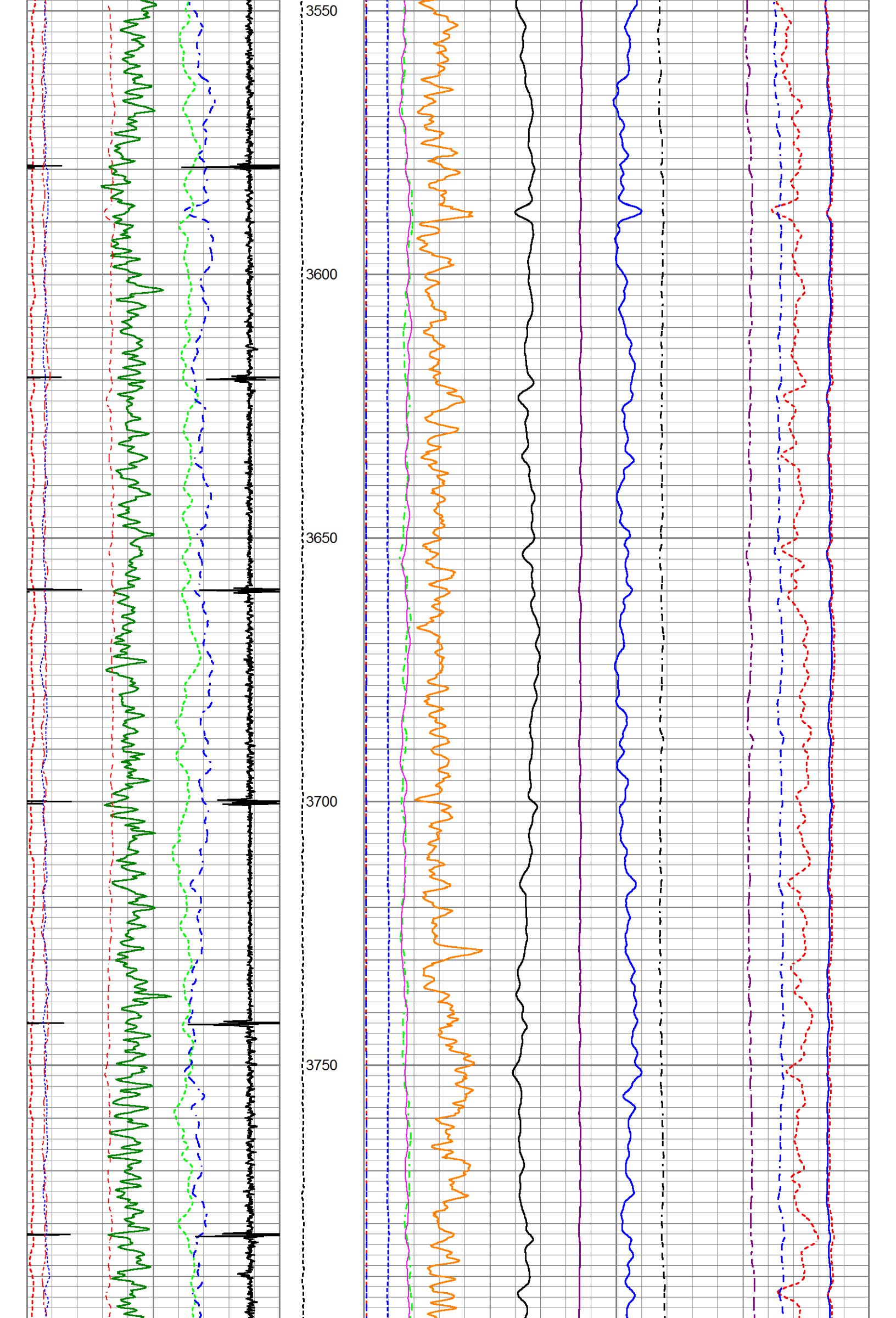
3150

3200

3250







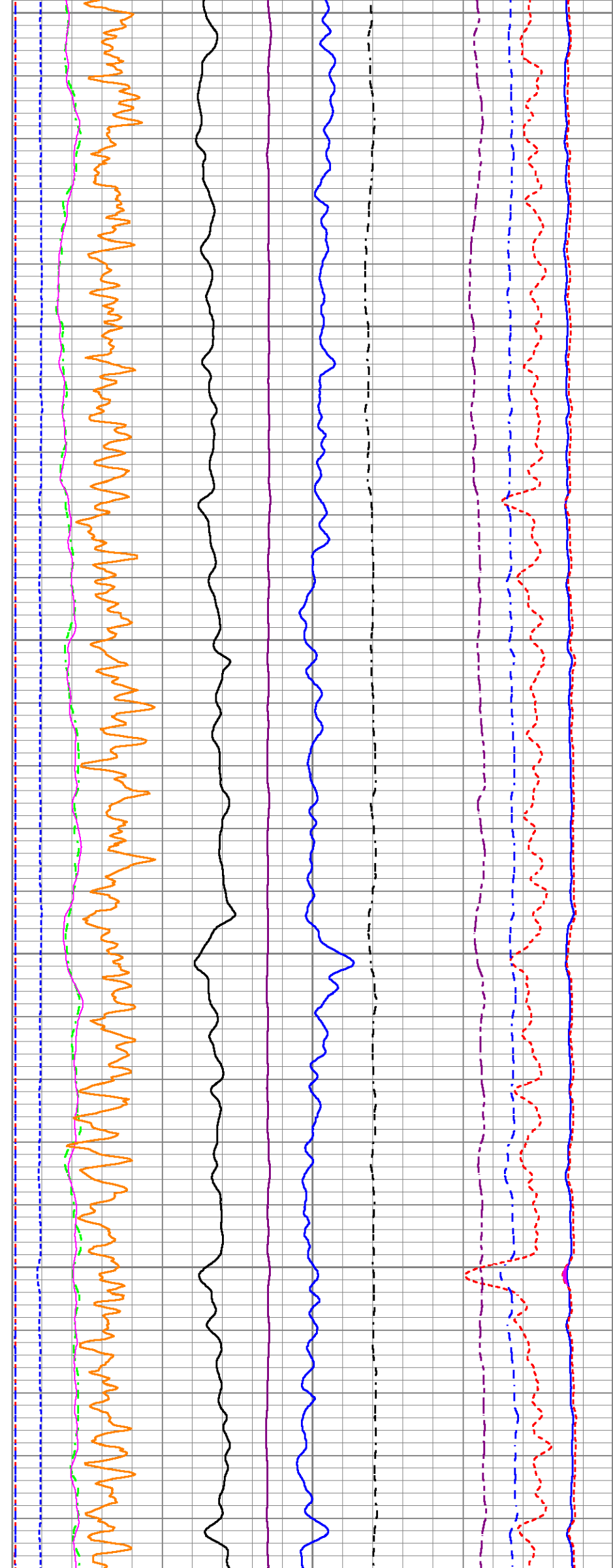
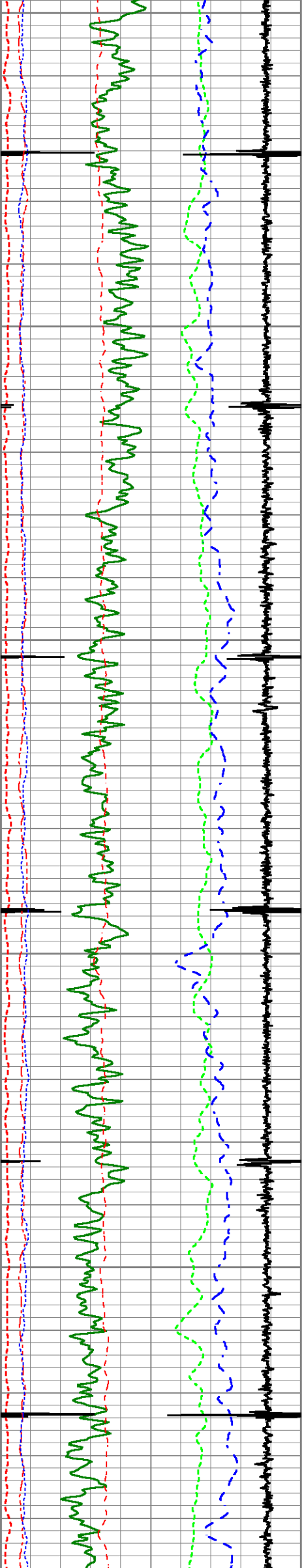
3800

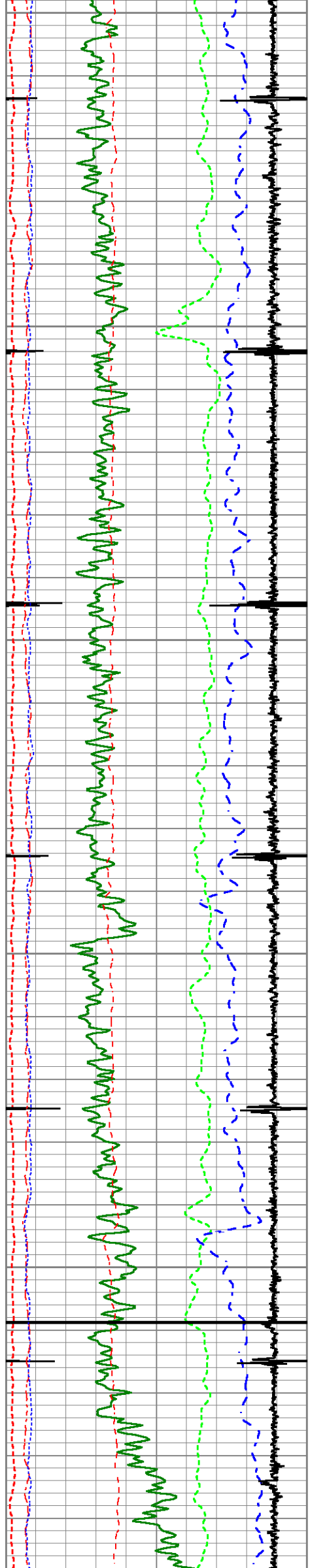
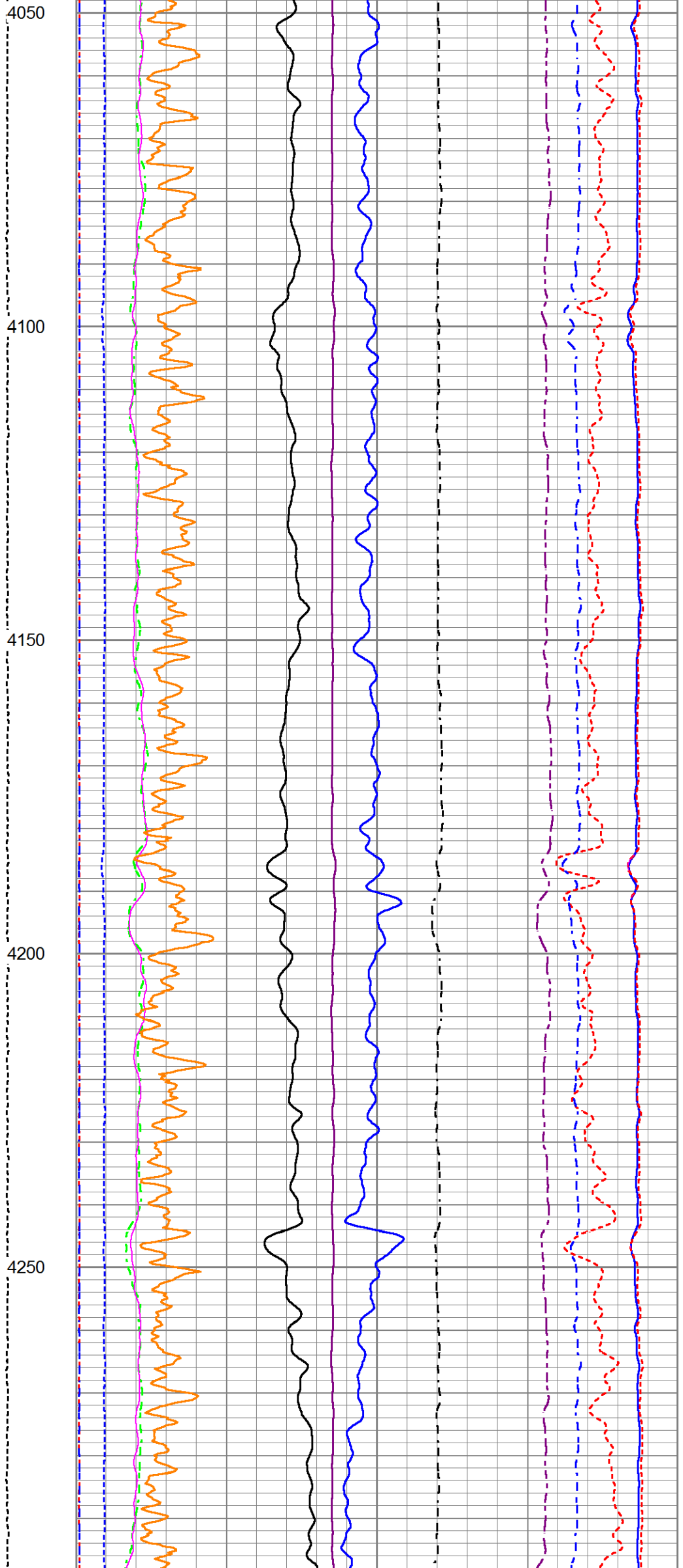
3850

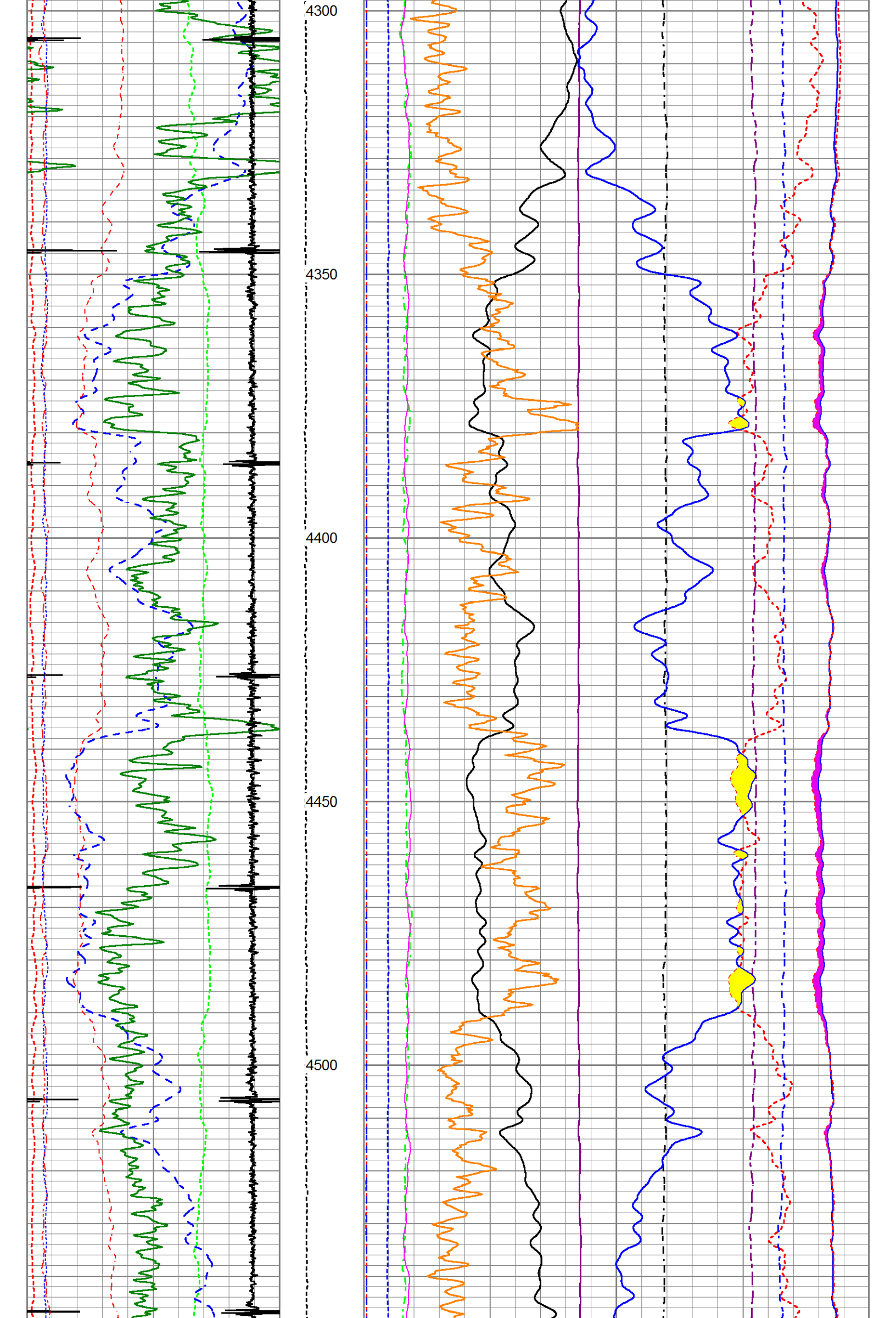
3900

3950

4000







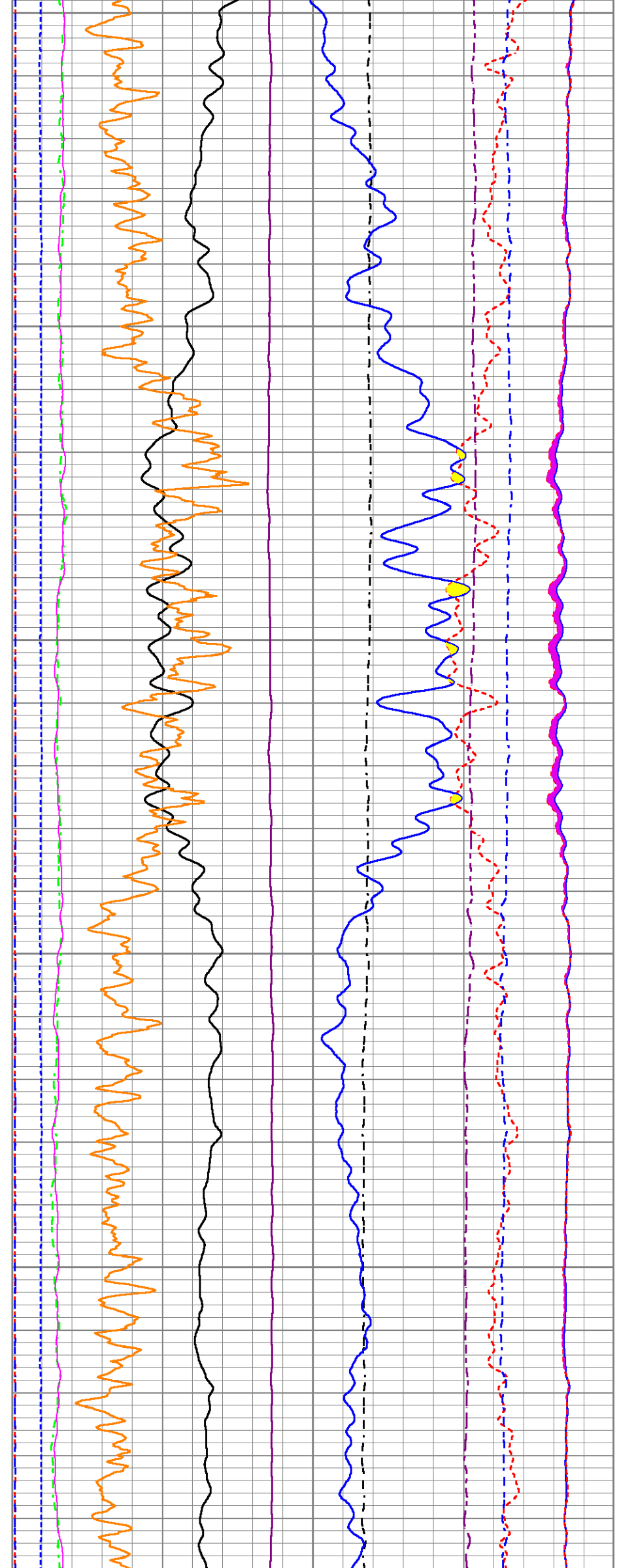
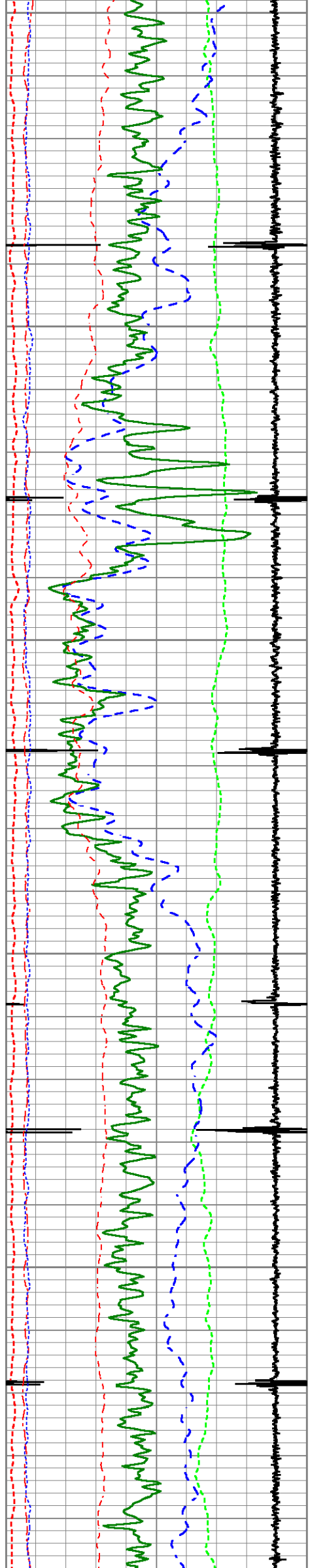
4550

4600

4650

4700

4750



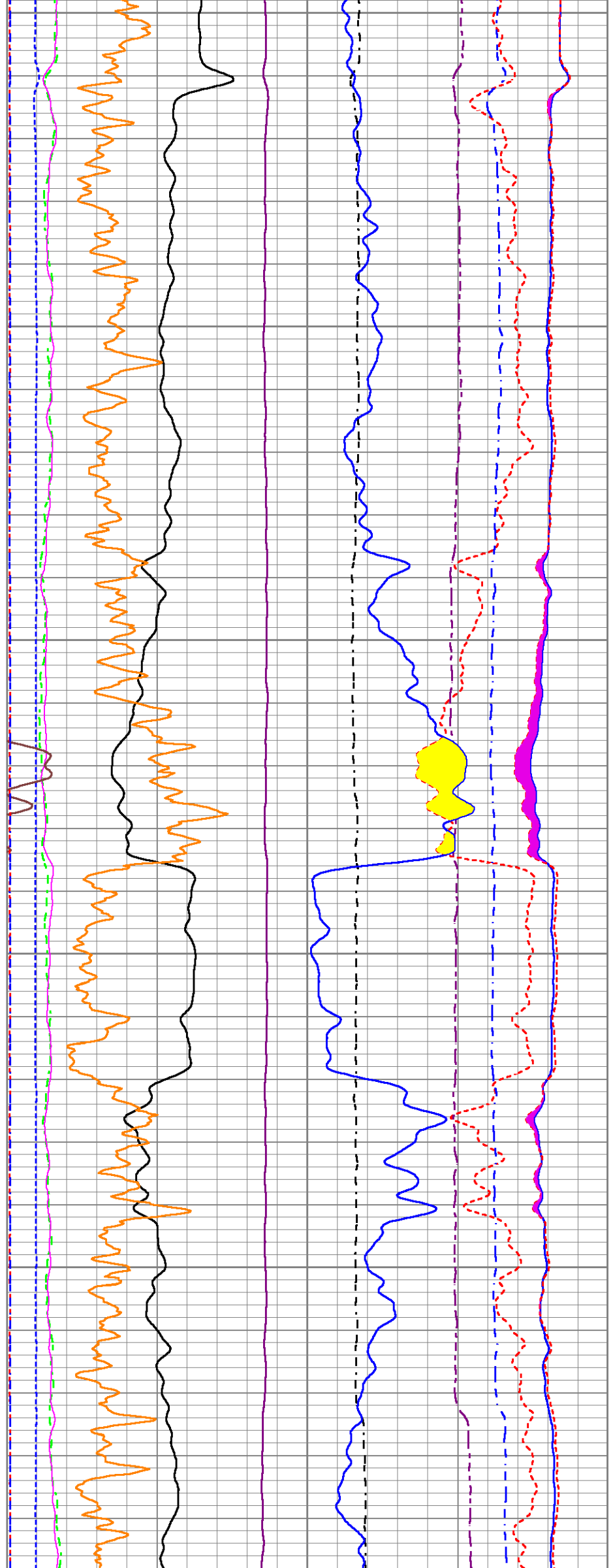
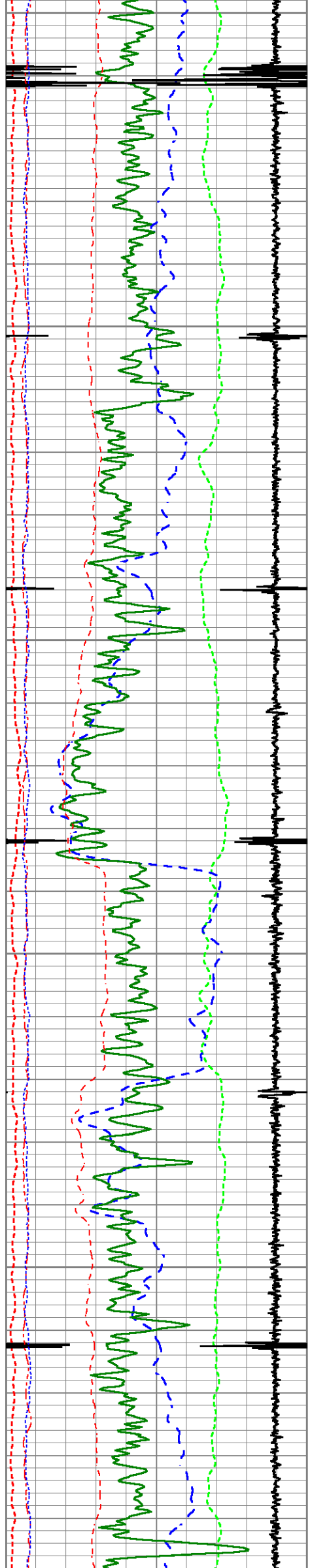
4800

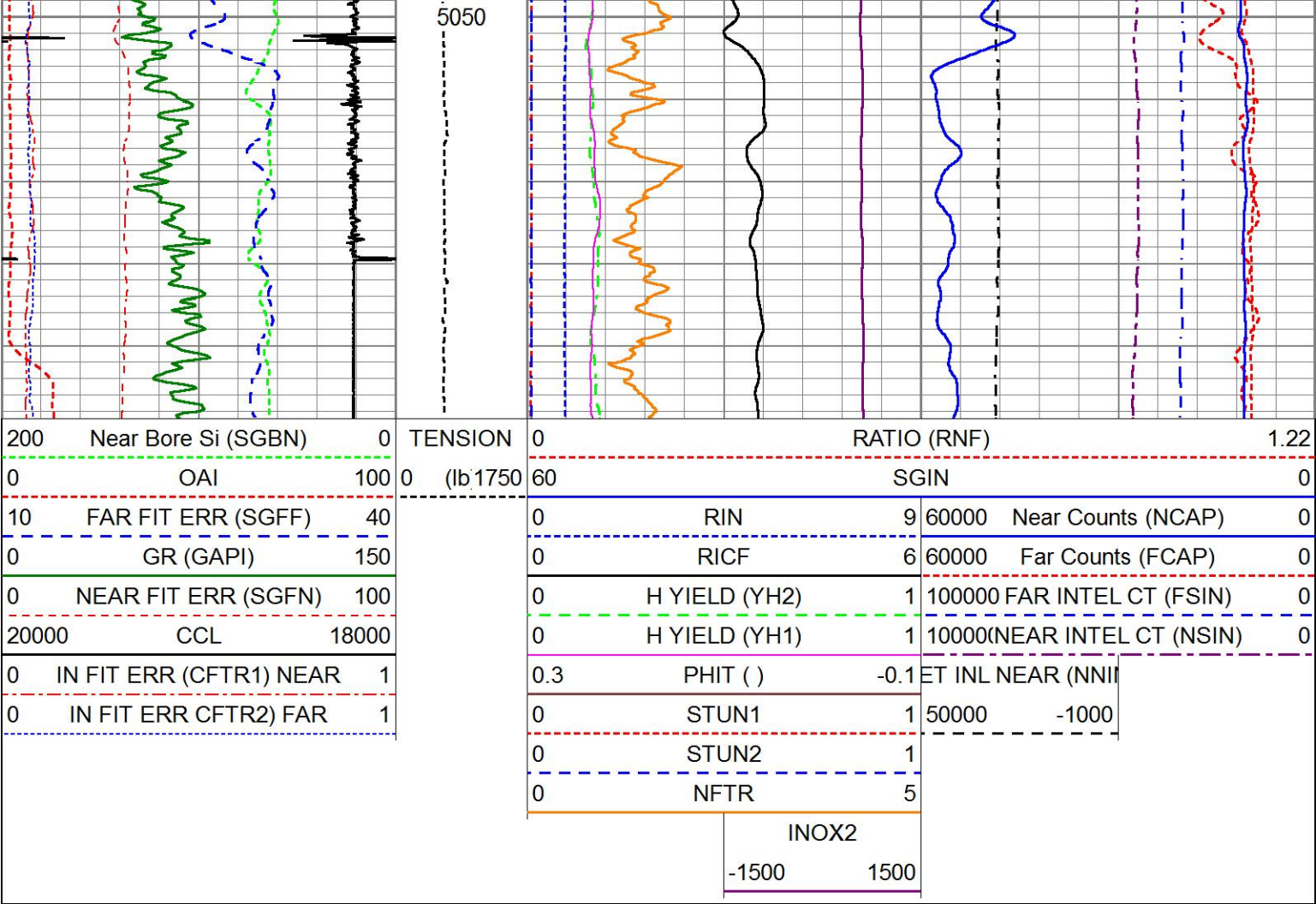
4850

4900

4950

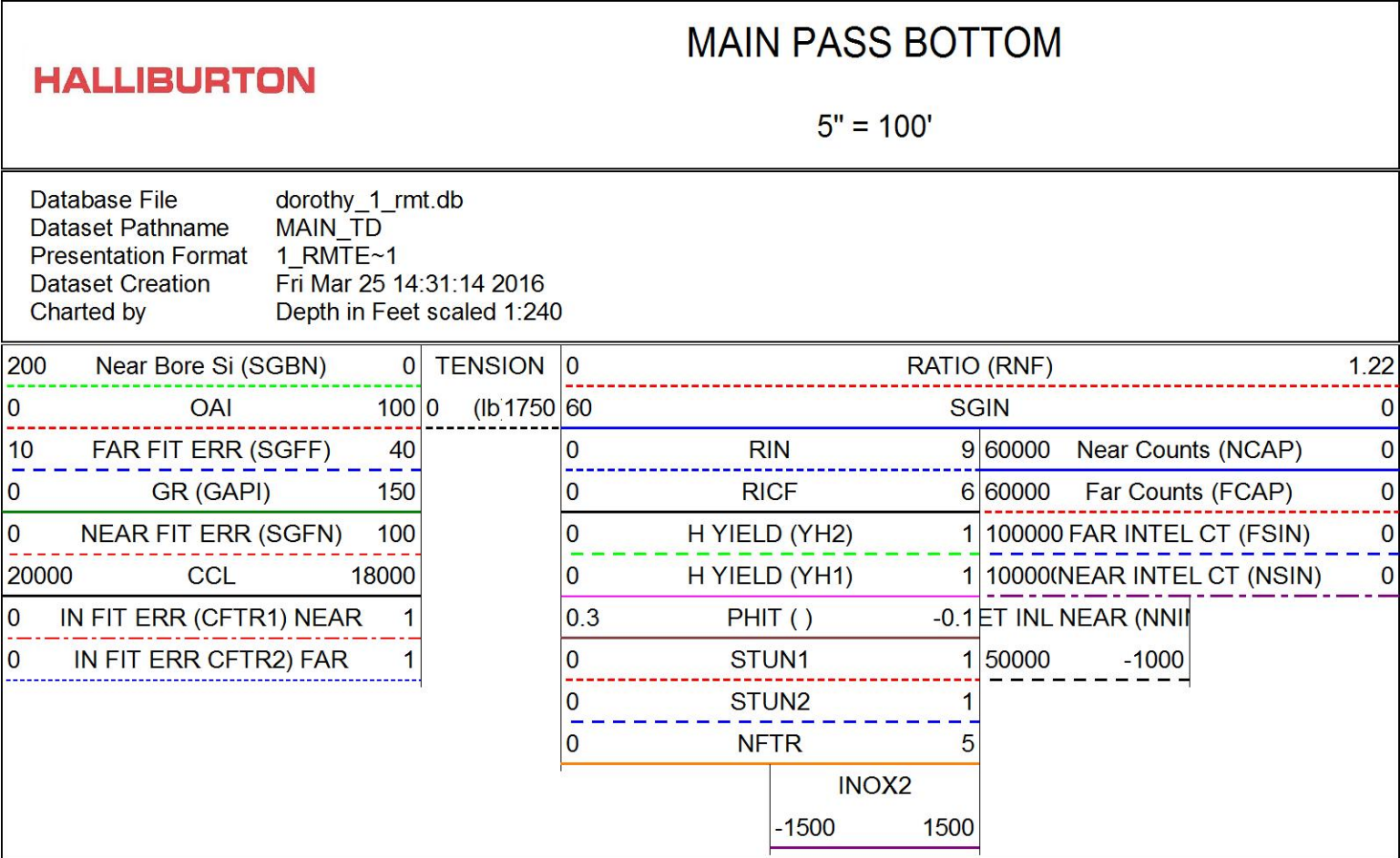
5000





MAIN PASS TOP

5" = 100'



MAIN PASS BOTTOM

5" = 100'

Database File dorothe_1_rmt.db
Dataset Pathname MAIN_TD
Presentation Format 1_RMTE~1
Dataset Creation Fri Mar 25 14:31:14 2016
Charted by Depth in Feet scaled 1:240

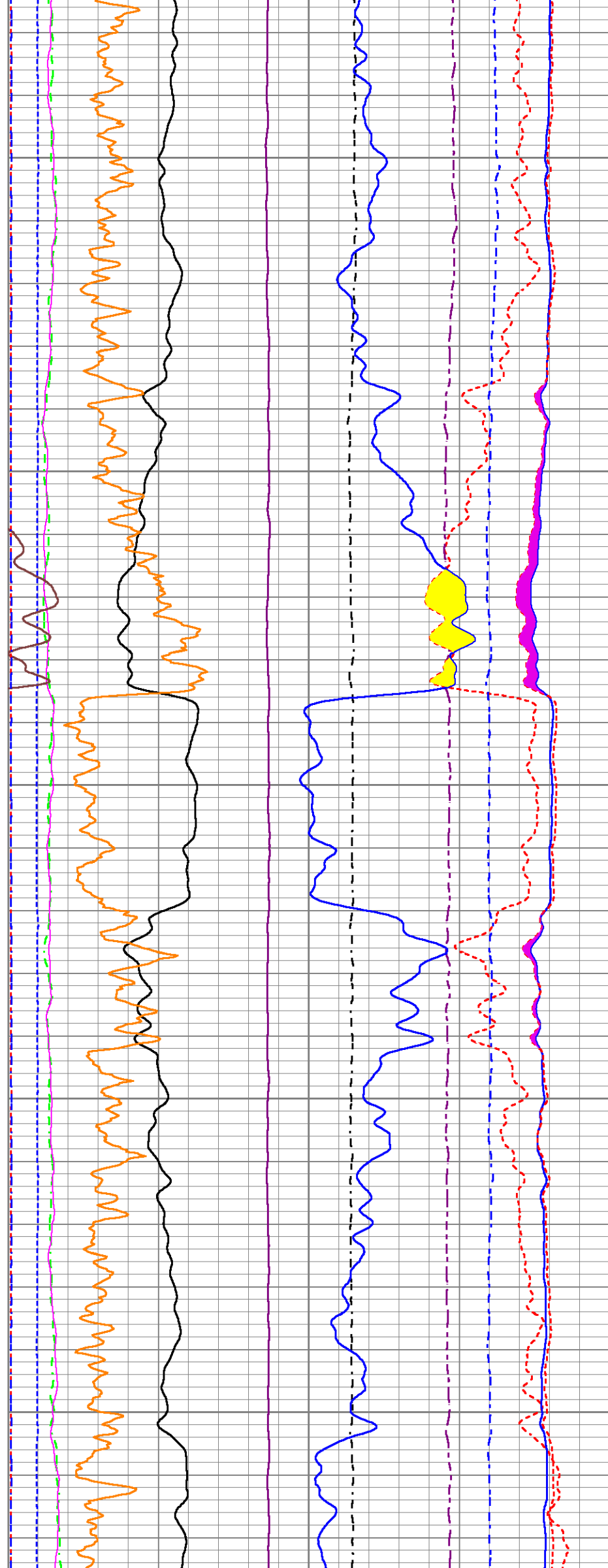
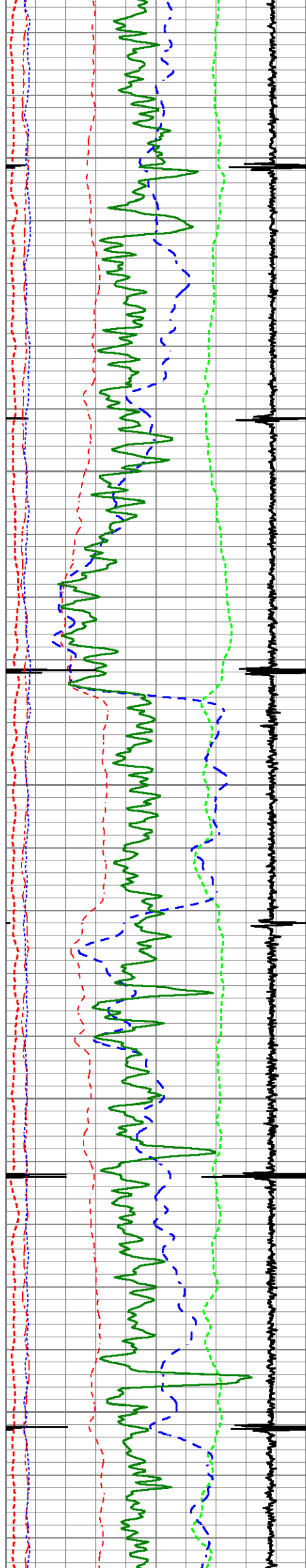
4850

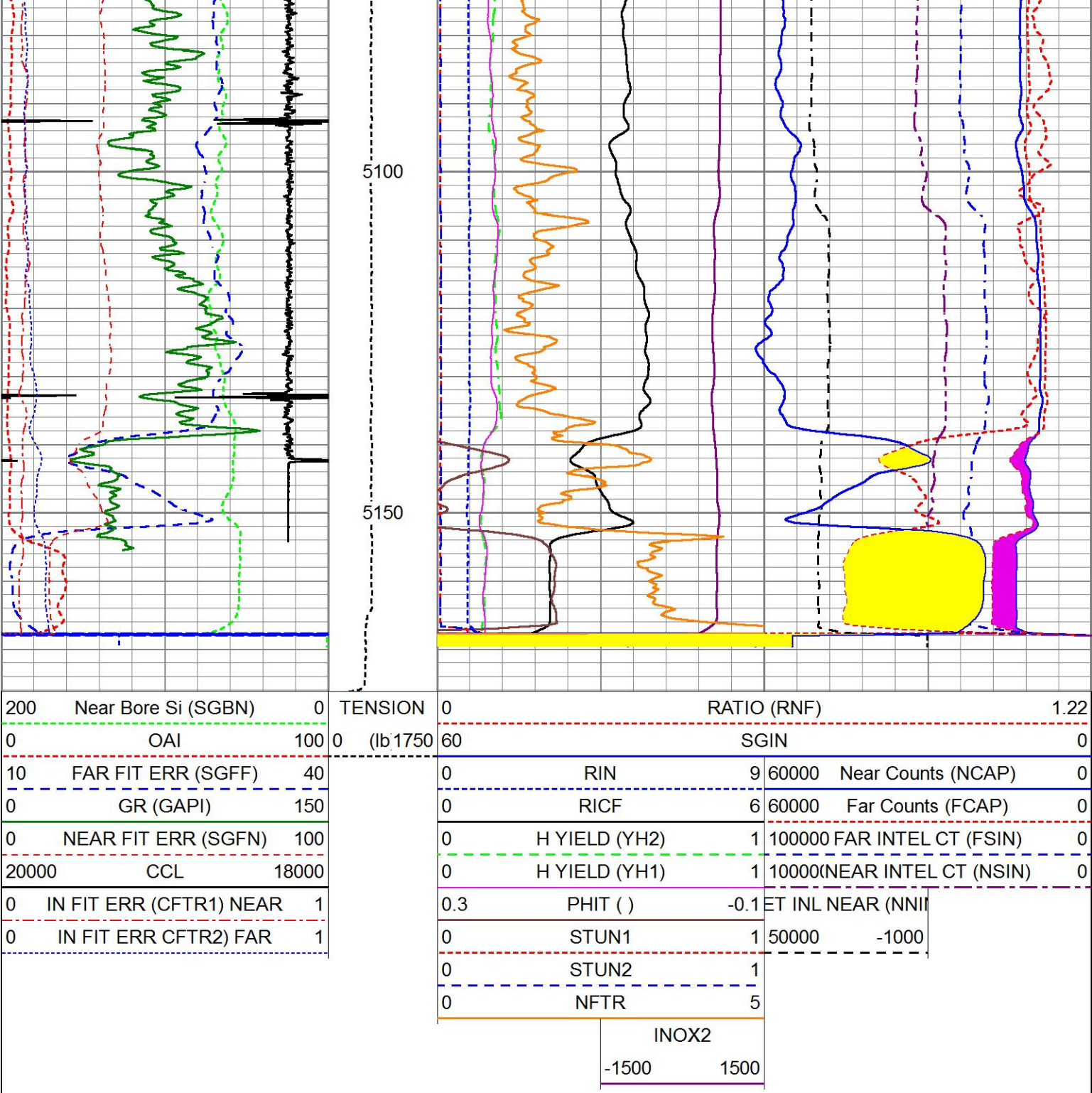
4900

4950

5000

5050





MAIN PASS BOTTOM

HALLIBURTON

5" = 100'

REPEAT PASS

HALLIBURTON

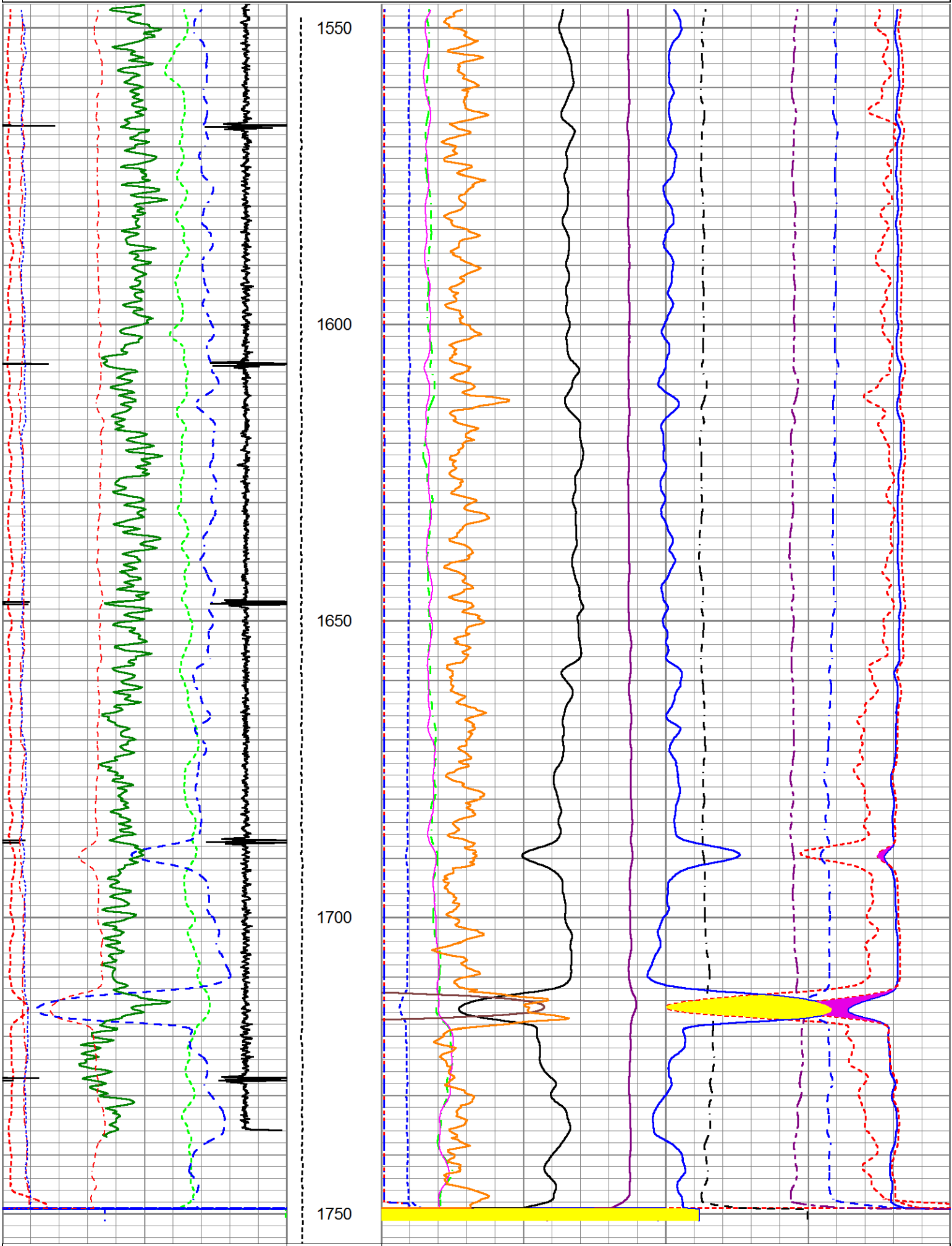
5" = 100'

Database File	dorothy_1_rmt.db
Dataset Pathname	RPT
Presentation Format	1_RMTE~1
Dataset Creation	Sat Mar 26 13:29:58 2016
Charted by	Depth in Feet scaled 1:240

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)		1.22
0	OAI	100	0 (lb 1750	60	SGIN		0
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP)
0	GR (GAPI)	150		0	RICF	6	60000 Far Counts (FCAP)
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000 FAR INTEL CT (FSIN)

20000	CCL	18000
0	IN FIT ERR (CFTR1) NEAR	1
0	IN FIT ERR CFTR2) FAR	1

0	H YIELD (YH1)	1	10000(NEAR INTEL CT (NSIN)	0
0.3	PHIT ()	-0.1	ET INL NEAR (NNII	
0	STUN1	1	50000	-1000
0	STUN2	1		
0	NFTR	5		
	INOX2			
	-1500	1500		



200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.22
-----	---------------------	---	---------	---	-------------	------

OAI			100	0	(lb/1750	60	SGIN			0
10	FAR FIT ERR (SGFF)		40		0	RIN	9	60000	Near Counts (NCAP)	0
0	GR (GAPI)		150		0	RICF	6	60000	Far Counts (FCAP)	0
0	NEAR FIT ERR (SGFN)		100		0	H YIELD (YH2)	1	100000	FAR INTEL CT (FSIN)	0
20000	CCL		18000		0	H YIELD (YH1)	1	10000	(NEAR INTEL CT (NSIN)	0
0	IN FIT ERR (CFTR1) NEAR		1		0.3	PHIT ()	-0.1	ET INL NEAR (NNI		
0	IN FIT ERR CFTR2) FAR		1		0	STUN1	1	50000	-1000	
					0	STUN2	1			
					0	NFTR	5			
						INOX2				
						-1500	1500			

REPEAT PASS

HALLIBURTON

5" = 100'

Log Variables

DatabaseC:\ProgramData\Warrior\Data\dorothy_1_rmt.db
Dataset field/well/run1/MAIN_TD/_vars_

Top - Bottom

BHTEMP_Src	BHSAL2	BHSAL1	POROS2	POROS1	CASEWGHT	LTH	UHSGC
ITEMPX	0	1	0	1	lb/ft 15.5	Sandstone	NONE
RHOFC	SO	BORSAL	CASED?	SRFTEMP	MudWgt	CASETHCK	CASEOD
0.25	in 0	kppm 150	Yes	degF 30	lb/gal 8.5	in 0.275	in 5.5
PERFS	TDEPTH	BOTTEMP	BITSIZE				
0	ft 5200	degF 155	in 7.875				

Calibration Report

Database File dorothy_1_rmt.db
Dataset Pathname MAIN_TOP1
Dataset Creation Sat Mar 26 07:33:56 2016

Reservoir Monitor Tool I Calibration Report

Serial-Model: 12270693-A
Shop Calibration Performed: Mon Mar 14 12:51:46 2016

Carbon/Oxygen Mode

Stabilization

Result	Logged	Expected Value	Diff.	Tol.	Units
GENV	94.00	80.00	14.00	+/-15.00	V
ITCR2	3158	3250	-92	+/-250	cps

Near Detector

	Channel	Expected Value	Amplitude	FWHM	Tol.
H	60	60 +/-2	0.0275	5.28	<6.00
Fe	207	206 +/-2	0.0937	-----	-----
NGAIN = 0.996	NZOFF = 0.1				

Far Detector


	Channel	Expected Value	Amplitude	FWHM	Tol.
--	---------	----------------	-----------	------	------

H	60	60 +/-2	0.0352	5.86	<6.50
Fe	210	208 +/-2	0.0894	-----	-----
FGAIN = 0.990	FZOFF = 0.4				
Flask Temperature	57.9 degF				
Result	Logged	Expected Value	Diff.	Tol.	Units
COIR2	0.45	0.45	-0.00	+/-0.02	
LIRI2	1.64	1.64	0.00	+/-0.05	
TCCR2	5015	5000	15	+/-1000	cps
ITCR2	3114	3200	-86	+/-250	cps

Sigma Mode					
Stabilization					
Result	Logged	Expected Value	Diff.	Tol.	Units
GENV	95.00	80.00	15.00	+/-15.00	V
FCAP	9771	10000	-229	+/-500	cps
Horizontal Water Tank					
Result	Logged	Expected Value	Diff.	Tol.	Units
N/F Normalizer	1.00	0.95	0.05		
N/F Inel Norm	0.65	0.61	0.04		
RNF	1.00	1.07	-0.07	+/-0.12	
RINC	1.55	1.64	-0.09	+/-0.18	
SGFN	24.10	24.00	0.10	+/-0.50	cu
SGFF	22.92	22.85	0.07	+/-0.50	cu
FSIN	23156	24000	-844	+/-2000	cps
FCAP	9774	10000	-226	+/-1000	cps
NFTR	0.84			<5.00	
FFTR	0.89			<5.00	
NBKG	166			<500	cps
FBKG	94			<500	cps
RTN	0.40	0.40	-0.00	+/-0.10	usec
RTF	0.42	0.40	0.02	+/-0.10	usec

Calibration Software Modules	
HRMTI Module	2013.11.14.0
RMTI Module	2014.8.28.1
Log Data Acquisition Software Modules	
HRMTI Module	2013.11.14.0
RMTI Module	2014.8.28.1

Gamma Ray Calibration Report			
Serial Number:	10010734		
Tool Model:	002		
Performed:	Tue Mar 08 14:57:04 2016		
Calibrator Value:	190.0	GAPI	
Background Reading:	42.0	cps	
Calibrator Reading:	184.4	cps	
Sensitivity:	1.3349	GAPI/cps	

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			STNDCH-STND_CH Fishing Neck	1.50	2.00	1.00

CCL	21.46						
GR	19.21		TTTCU-002 (10010734) Through Tubing Telemetry Cartridge - Ultrawire	7.65	1.69	100.00	
			XHU-003 (11899561) Crossover Halliburton 1553 to Ultrawire	1.58	1.69	7.00	
RmtTFGT RmtTNGT	8.55 8.05		RMTI-A (12270693) Halliburton RMTI Tool	14.00	2.13	77.00	
RmtFP5V RmtCommFWar LLMTEN	0.30 0.30 0.00		BUL-001 (000001) Bullnose	0.30	1.69	1.50	
Dataset: dorothy_1_rmt.db: field/well/run1/RPT Total length: 25.03 ft Total weight: 186.50 lb O.D.: 2.13 in							

Company	East Cheyenne Gas Storage, LLC.
Well	DOROTHY STRANGE #1 WP-D011
Field	West Peetz

County	Logan	State	CO
HALLIBURTON	RESERVOIR MONITORING TOOL ELITE		